OCT -5 1953

VOL. 179 No. 3 AMERICAN SEPTEMBER, 1953

B 433108

Gas Journal

You Can RELY ON ROCKWELL

FOR SIMPLICITY WITH SAFETY

ROCKWELL "015" REGULATORS WITH Spring Control

TAMPERPROOF

SENSITIVE

EASILY ADAPTABLE

THE LIBRARY OF CONGRESS SERIAL RECORD OCT 12 1953

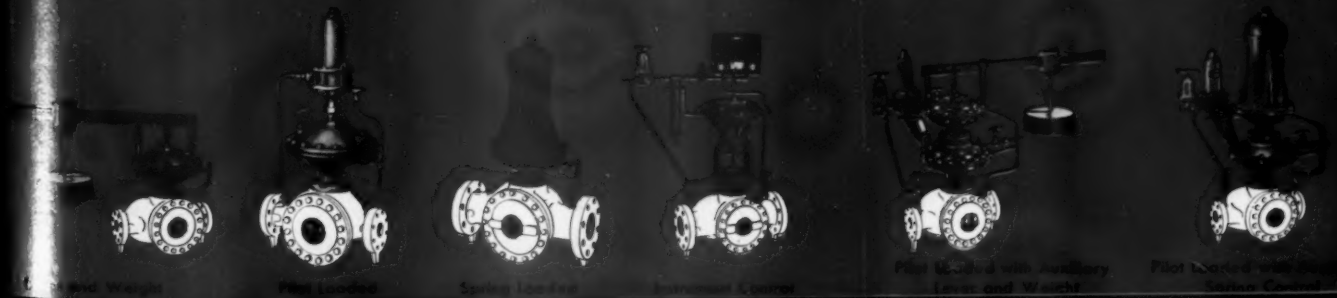
Want a completely enclosed regulator for safety reasons? Need one that conserves space? Got a problem of exceptionally dirty gas that hampers the use of pilot control? Then the Rockwell "015" Spring Loaded regulator is your best bet. It is made with big, heavy duplex springs having long travel to provide close control over an outlet pressure range of from 2 to 100 psi.

Don't overlook the ease with which this Rockwell regulator can be adapted to meet changing conditions. Any of the varied control systems (see below) can be applied to the basic body. And interchangeable inlet bowl assemblies permit all Rockwell "015" regulators to be sized up or down to take care of increased or decreased demands. Full details are given in bulletin 1086. Write for it today.

ROCKWELL MANUFACTURING COMPANY

PITTSBURGH 8, PA. Atlanta Boston Chicago Houston Los Angeles N. Kansas City New York Pittsburgh San Francisco Seattle Tulsa

ALL THESE CONTROL SYSTEMS APPLY TO THE SAME BASIC REGULATOR BODY



Pilot Loaded

Spring Loaded

Pilot Loaded with Auxiliary Lever and Weight

Pilot Loaded with Auxiliary Spring Control

HERE'S HOW TO MAKE YOUR

TEN YEAR METER CHANGE

Save time, trouble, money

Simply Replace the Measuring Unit

You get more than compact, lightweight accurate meters when you invest in Rockwell aluminum case domestic meters. You gain the exclusive advantage of a working mechanism that, after a period of years, may be wholly replaced with either a new or rebuilt unit in the same meter body. Only a screw driver is needed to make the switch. And meter repairs the Rockwell way can be made by anyone in a few minutes time.

In addition to our regular interchangeable repair parts service, we can now offer you the option of returning worn internal measuring units or complete meters to the factory for economical rebuilding.

Check our modest repair price schedules now. Ask the Rockwell representative or write.

You Can RELY ON ROCKWELL

ROCKWELL MANUFACTURING COMPANY

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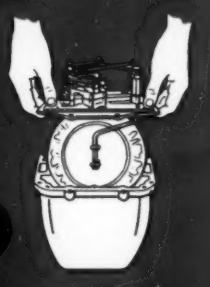
GET NEW METER LIFE THIS EASY, ECONOMICAL WAY

1

Remove a few screws—then lift cover from meter body.



2

The old measuring unit can now be pulled from the body.

3

Insert a factory fresh replacement unit (either new or rebuilt) in the same meter body and replace cover.

4

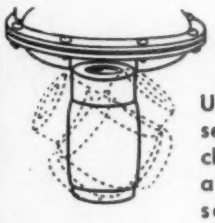
Ship the old unit to the factory for economical repairs.

ROCKWELL *Aluminum* METERS

A SIZE FOR EVERY DOMESTIC MEASUREMENT NEED

OCT - 8 1953

NEW SERIES 1400
Reliance Regulators



Installed in any position —

Union type removable pipe section installs quickly in close quarters. No need to align with diaphragm section.

- Precise regulation over a wide range of flows and supply pressures
- Large area vent for emergency gas escape in case of excess pressure
- Accurate setting of outlet pressure by standard regulator spring
- Minimum maintenance expense — ruggedly built for trouble-free service

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AMERICAN METER CO

AMERICAN®
METER COMPANY
INCORPORATED (ESTABLISHED 1836)

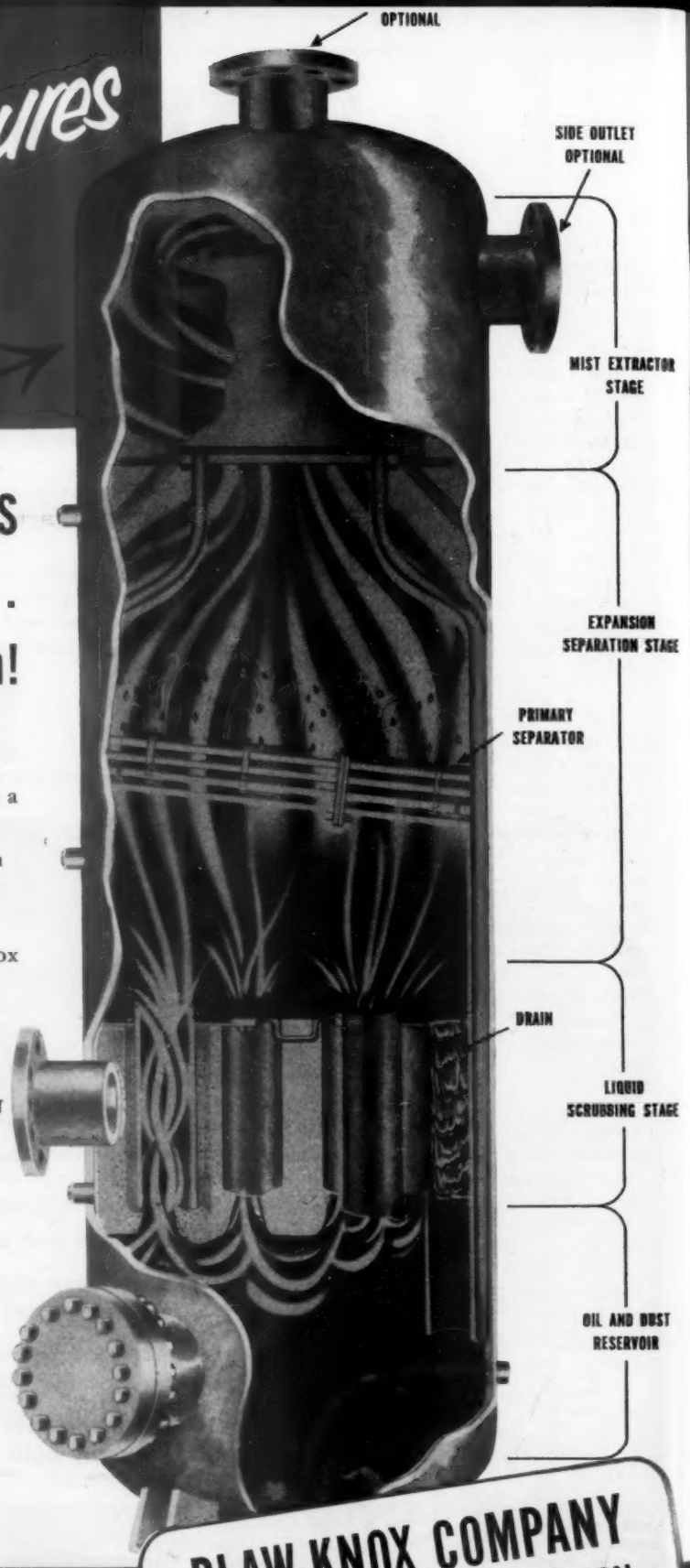
AMERICAN GAS JOURNAL, September, 1953. Vol. 179, No. 3. Published monthly (except October, then semi-monthly), by American Gas Journal Inc., at 73 Main Street, Brattleboro, Vt. Entered as second class matter January 24, 1950, at the post office at Brattleboro, Vt. under Act of March 3, 1879. Executive and editorial offices at 205 East 42nd St., New York 17, New York. Subscription prices, U.S. $3 per year; Canada $4; Foreign $10. Single copies 50 cents, except October 15 issue, which is not sold separately. Printed in U.S.A.

No half-way measures here

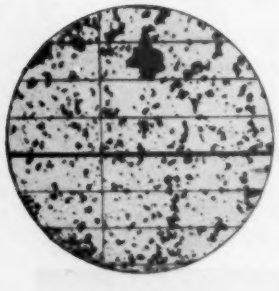
BLAW-KNOX GAS CLEANERS GET ALL SIZES OF DUST...

Down to the smallest micron!

Of all the devices and methods for preventing damaging, abrasive dust from getting into gas mains, only the *oil scrubbing* type cleaner does a truly thorough job—only oil scrubbing gets those microscopic particles that play hob with compressors, valves, meters and pilot orifices. In extensive field tests covering a period of years our engineers have found that Blaw-Knox Gas Cleaners connected to unusually dirty mains showed that the outlet gas contained not more than 0.000005 pounds of dust per 1000 cubic feet! Any gas engineer would call that "really clean gas."



HOW BIG IS A MICRON?



In this photomicrograph at 200 magnifications the narrow lines are one micron wide. Note that many dust particles are even smaller. For complete information on Blaw-Knox Gas Equipment and the subject of pipe line dust, write for Bulletin 2353.

BLAW-KNOX

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
GAS EQUIPMENT DEPARTMENT
PITTSBURGH 22
PENNSYLVANIA

AMERICAN Gas Journal
ESTABLISHED 1859

VOLUME 179 SEPTEMBER 1953 NUMBER 3

This month...

It is a matter of surpassing satisfaction for us to be able to congratulate our esteemed contemporary, *Gas Age*, on its discerning eye for elegant diction and effective writing. In its August 13 editorial, on the defeated Kent Bill in Pennsylvania, the editors commented approvingly on an editorial summarizing public reaction to the bill, as it had appeared in the *Oil City Derrick*, a Pennsylvania daily newspaper. The quotation selected was the closing paragraph of our own June editorial, "The Pennsylvania Coal Grab," which the *Derrick*, along with other newspapers in the state, had reprinted with our enthusiastic permission. Thus does a good deed shine in a naughty world.

• • •

With the American Gas Association convention hard upon us, next month, it is most appropriate that we demonstrate a new gas industry technology, first applied by the host-utility of the convention, Laclede Gas Company, St. Louis. On page 14, Edwin F. Trunk, Laclede development engineer, describes the McIlroy electronic network analyzer that has just been installed to give the distribution system design calculations that are needed to meet either existing or anticipated operating conditions. Rapid results are obtained in calculations that previously required hours and days. This, to our way of thinking, is another excellent example of advanced technologies that will be adopted continually by the gas industry for precision, speed, convenience, reliability and overall operating economies.

• • •

By way of a report-to-readers, we note that we are now busily engaged with the final polishing of the 1953 edition of *American Gas Handbook*. It will be in the mail next month to all current subscribers to AMERICAN GAS JOURNAL. Published since 1922, the *Handbook* is now revised annually to assure our readers of having a condensed engineering library of the data, charts, formulas and product information that is related to gas operating problems.

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October 15 Handbook issue not sold separately.

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No. 6 of a series

To sell her the *GAS* range, show her the *SELF-RELIGHTING* feature of the

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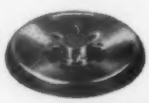
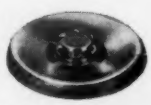


Click . . . here's efficient "Center Simmer" that maintains boiling in any covered vessel.



Click . . . a gentle "Keep Warm" heat . . . without further cooking.

**Write for names of ranges featuring ALLTROL Center Simmer.*

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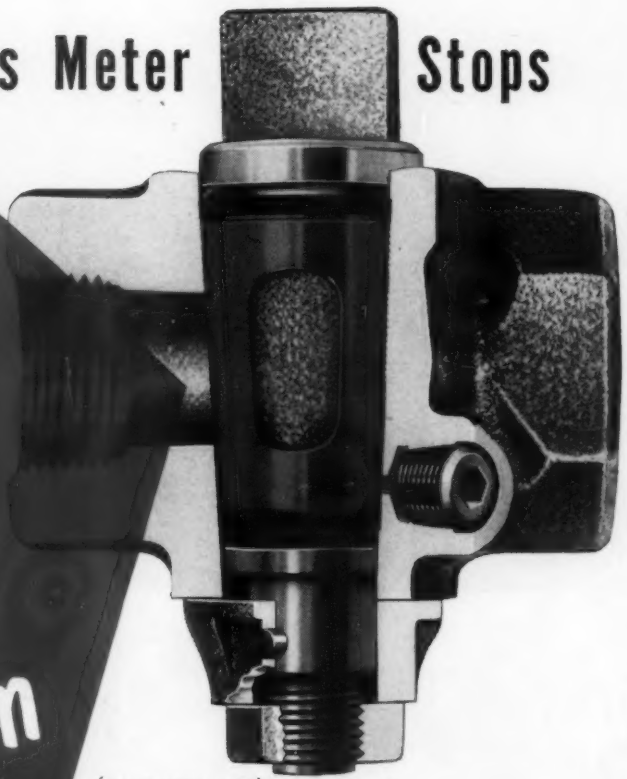
ALLTROL® CENTER SIMMER

MUELLER®

LubOseal® Gas Meter Stops

with

Positive Automatic Lubrication



(PAT. APPD. FOR)

NO-BLO

Mueller LubOseal Gas Meter Stops are always lubricated and ready to be operated. The exclusive lubrication system of the LubOseal Stop provides 100% lubrication of all contact parts of key and body.

This is due to the lubricant pressure created by the distortion of the "O" rings at both the top and the bottom of the key when the Stop is originally lubricated. As the Stop is operated, the "O" rings tend to regain their natural shape and thus force the grease into the four vertical grooves of the key. Whenever the key is turned 90° or more, a film of grease is spread on all contact parts. This constant pressure of the "O" rings maintains correct lubrication over long periods of time without maintenance.

To periodically service the Stop, the pipe plug is removed and the hole filled with grease. Screwing the plug into the hole hydraulically forces the grease to all parts of the Stop and again distorts the "O" rings, re-creating automatic grease pressure. Plain Head (H-11170) and Lock Wing (H-11175) in stock in sizes ¾" through 2", black or galvanized finish. Write Dept. 36 for complete details.

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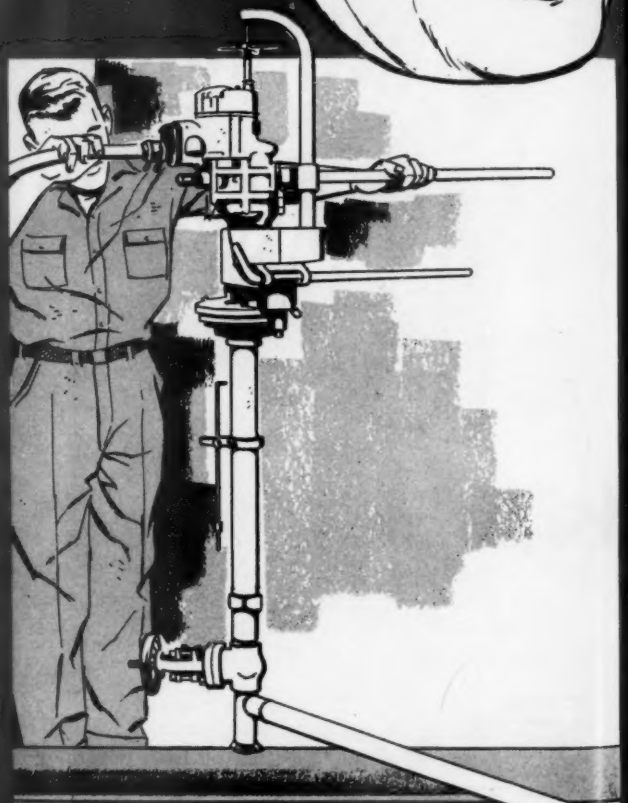
Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

MAKE HIGH PRESSURE GAS SERVICE CONNECTIONS SAFELY WITHOUT REDUCING LINE PRESSURE

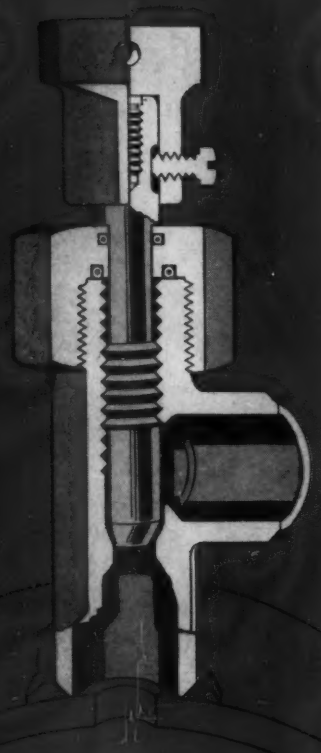
STEP 1. WELD TEE TO MAIN

REMOVE HANDLE, CAP AND STEM FROM TEE. WELD INLET OF TEE TO MAIN AND WELD SERVICE LINE TO SIDE OUTLET. THEN THREAD A MUELLER H-10916 GATE VALVE (HIGH PRESSURE) TO TOP OF TEE.



STEP 2. DRILL HOLE INTO MAIN

ATTACH THE MUELLER DH-2 DRILLING MACHINE TO THE GATE VALVE AND DRILL HOLE INTO MAIN. (MACHINE MAY BE POWER OR HAND OPERATED WITH HAND OR AUTOMATIC FEED.) CLOSE GATE VALVE AND REMOVE MACHINE.

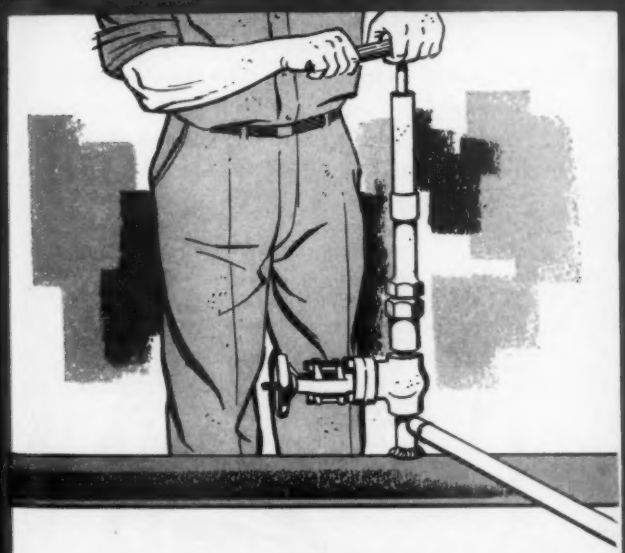


MUELLER CURB VALVE TEE

A MUELLER H-17800 Curb Valve Tee lends itself to any practical high pressure installation. Here it is being installed as a control valve on a service line from a high pressure main or transmission line. (Farm Tap) *Maximum pressure 1200 p.s.i.*

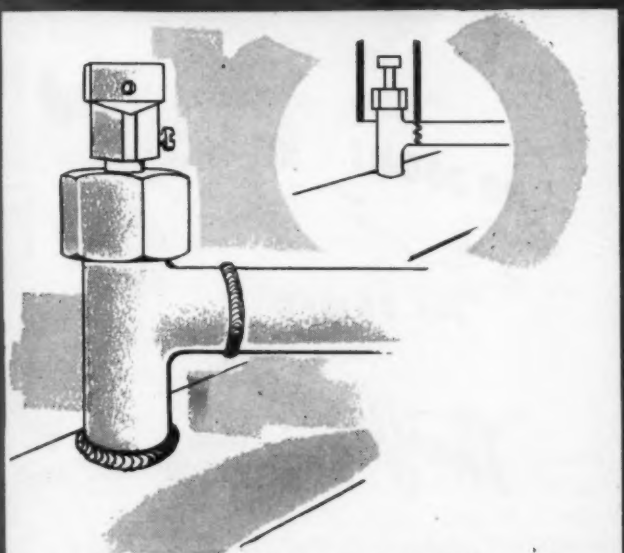
The Tee is ruggedly constructed of forged steel with a high strength silicon bronze stem, bar stock steel cap and heavy malleable iron tee head. "O" Ring Seals in the cap positively prevent leakage to the outside. The built-in valve provides a metal-to-metal line contact in both the open and closed positions. The stem is tapped for an inserting tool which enables it to be inserted under pressure.

The H-17800 Curb Valve Tee is available with welding or threaded inlets and welding or threaded outlets. Sizes 1", 1¼", 1½" and 2". Request Catalog DH-2 for complete details.



STEP 3. INSERT STEM INTO TEE

THREAD VALVE STEM DIRECTLY ONTO SHAFT OF MUELLER H-17145 COMPLETION MACHINE AND ATTACH MACHINE TO GATE VALVE. OPEN GATE VALVE, ADVANCE SHAFT AND SCREW STEM INTO TEE TO A SEAT, SHUTTING OFF GAS. REMOVE MACHINE AND GATE VALVE.



STEP 4. COMPLETE INSTALLATION

REPLACE STEEL CAP AND IRON TEE HANDLE. VALVE MAY NOW BE OPENED AND SERVICE PUT INTO OPERATION. MOUNT A CURB BOX OVER THE CURB VALVE TEE AND IT MAY BE ACTUATED AT ANY TIME BY USING AN ORDINARY SHUT-OFF ROD.

MUELLER NO-BLO **Method**

This is another of a series of gas distribution problems and their step-by-step solution by Frank Miller, Gas Service Engineer of Mueller Co.

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Make extra sales with the furnace that has all these features!

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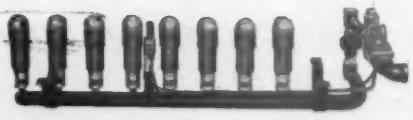
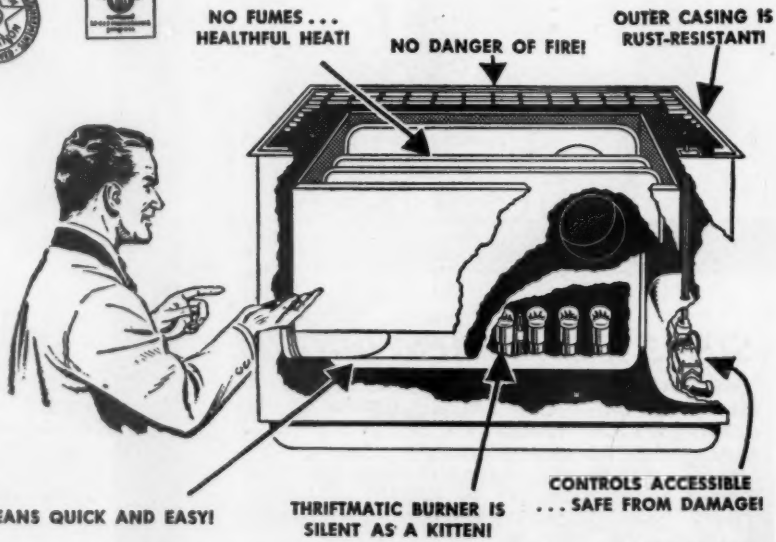
NO BOOM! NO BANG! NO TICK!

The FAMED "Thriftmatic" Gas BURNER

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NO DANGER OF FIRE!
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THRIFTMATIC BURNER IS SILENT AS A KITTEN!
CONTROLS ACCESSIBLE . . . SAFE FROM DAMAGE!

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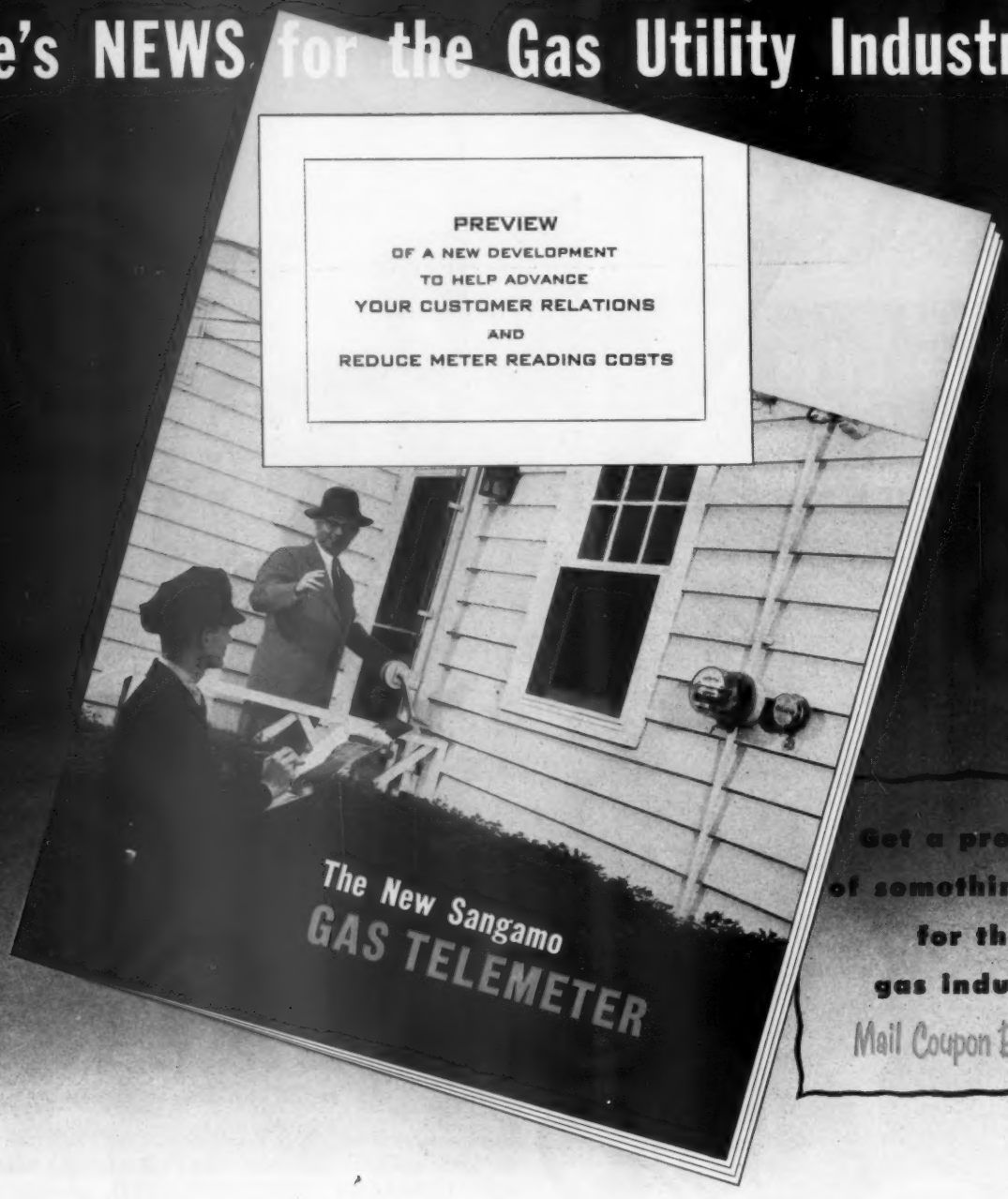

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This booklet gives full information about a simple pneumatic device that can speed meter reading . . . reduce expense for the company . . . eliminate "skips" and obsolete the practice of rendering estimated bills . . . and end the nuisance caused by the meter reader entering the customer's premises.

* * *

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3. An extra-liberal CALORIC financed floor plan which enables you to become a CALORIC dealer without over-extending yourself.
4. Fifty-two warehouses, located throughout the country, mean speedier delivery . . . faster service . . . no back-breaking inventory worries.
5. The heaviest concentration of sustained advertising in the entire gas range industry—and it's getting bigger all the time.
6. A new merchandising and point of sale program designed to help YOU make the most of CALORIC features and customer benefits.
7. Best of all, you've got the famous name CALORIC on a line of products that housewives know from experience are quality through and through.

Cash in on all of these 7 selling advantages. Sell the modern, automatic gas ranges and dryers that give your customers the greatest value—*give you the greatest profits.*

Start selling Caloric today!

Caloric® STOVE CORPORATION, TOPTON, PA.

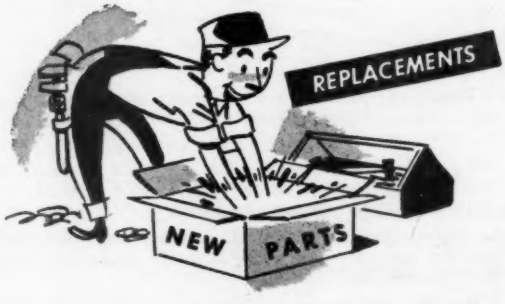
the importance of GOOD MAINTENANCE

Good Housekeeping is always part of a gas superintendent's makeup. It is a never ending job — constant watching for small leaks, minor repairs, major replacements. Some matters require immediate attention, others long range planning.

A sound maintenance program — clearly defined, thoroughly understood and properly administered — will increase productivity and at reduced cost, with satisfied employees in a safer environment.

Now is the time to look for bottlenecks, to alter, to add . . . to study not only the condition of equipment, but likewise the process of operation.

Gasmaco engineers, construction supervisors, operators, are qualified to assist you by inspection . . . recommendations . . . repairs . . . replacement. You can and should avail yourself of this experience in all phases of water gas, oil gas, reforming, light oil recovery, purifiers, condensers, scrubbers, piping, valves — any equipment or service which your plant requires.



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Designers • Fabricators • Erectors
Gas Plant Equipment and Industrial Furnaces

THE GAS MACHINERY CO. (Canada), Ltd.
HAMILTON, ONTARIO

Editorial:

Pattern for Profit

JUST a month ago, under the stern mandate of what we conceive to be our duty to the industry, we composed a dour dispatch for this page, decrying the American Gas Association's timorous and inconclusive approach to its responsibility under the Industry Development Program. Particularly, we deplored the absence of concrete recommendations on promotional procedure by types of appliances, market analysis and dealer relations.

Today, we are confronted with the hopeful and heartening responsibility of eating crow on many of these observations. The reason is the appearance and distribution to the gas companies of the new AGA dealer program, Pattern for Profit. This is, without exception, the most complete and the most specific set of recommendations for gas industry development through dealer cultivation and cooperation that has ever been offered by anyone.

Although, technically, the Pattern for Profit program is a PAR plan activity of the association, it can well be viewed by both the gas utility and the gas appliance manufacturing industries as the first tangible and long step forward toward the goals of their joint Industry Development program.

More than two years in the making, under the auspices of the dealer sales committee of AGA's residential gas section, the new program appears at a most fortuitous time in gas industry affairs. It appears at a time when both utilities and manufacturers have completed the most searching analysis of their own shortcomings and resolved to face the unpleasant revelations with a program of action instead of further palaver. It appears at a time when some of the timid souls, which are legion, among manufacturers are already beginning to revert to the old theme of blaming their own failures on the gas utility industry. It appears at a time when the utilities themselves have been succumbing to the feeling, promotion-wise, that they were all dressed down, from within and without, with no place to go. It appears at a time when other industries, particularly the retail dealers, having been prewarned of a new stirring in gas appliance promotion, were wondering when the first brave pennant would appear over the horizon.

We will not dilute the impact of the entire Pattern for Profit program by attempting to present it in capsule form for any gas executive or any appliance manufacturer who is too busy to study it in all of its imposing and logical detail. Anybody who is too busy for such a revelation of how his business now stands, and how it can be immediately stimulated and revitalized by a program of definite action, is too busy to stay in business.

The responsibility for the future growth of gas appliance sales through dealer-cooperation now rests on the shoulders of both the gas companies and the gas appliance manufacturers. Pattern for Profit, as far as a gas company is concerned, can be either the chart and guide toward a merchandising program of infinite possibilities, or it can remain merely a collection of high-priced printing gathering dust in the good-intentions file.

To the manufacturers of appliances it can be the starting gun, warranting their all-out cooperation in advertising expenditure and promotional support of the cooperating utilities, or it can be another excuse for them to drift with the tide, until they see how the results show up on their quarterly sales figures.

There are too many makers of gas appliances who are vigorous and forceful talkers on the abstractions of industry affairs, but little more than congenital free-loaders when it comes time to support the industry. Those, the utilities should ruthlessly exclude from their merchandising programs. It can safely be assumed that the manufacturer who does not support utility merchandising plans and does not keep the utilities aware of his support, does not want utility cooperation. It is just as simple as that and, in our opinion, those who do not court cooperation should not enjoy it. No *quid* no *quo* should be the rule.

Unquestionably the major share of the burden of revitalizing domestic gas appliance sales through dealers must be borne by the local gas companies. With the Pattern for Profit program they will have their hands full. Dealers long-neglected and many of them weaned away from gas by the blandishments of electrical competition, will not come flocking to the gas standard just because somebody offers them a decal sign to stick in the corner of a show window. Patience, education and, above all, rigorous fair practice in dealer relations will be required.

This is no shot-in-the-arm program, good for a month or a season. It is a long-range projection of what the united gas industry, working together, can do to blast its merchandising effectiveness out of the doldrums, to get its timid souls away from the wailing wall, and to start once more on the road to high public esteem and endorsement.

And it has inherent in it the potential for making every distributing gas utility once more master of its own house, arbiter and inspiration of gas and appliance sales in its own area, and architect of the load pattern most desired for successful and profitable operation.

Pattern for Profit is what the gas industry needs—if the gas industry can now demonstrate that all of its members have what it takes.

Elliott Taylor

Laclede Applies McIlroy Network Analyze

by Edwin F. Trunk

Development Engineer
Laclede Gas Company

THE use of gas in the St. Louis area for househeating increased greatly following the conversion to straight natural gas in 1949. The peak day requirements increased from a sendout equivalent to 100,000 Mcf in the winter of 1948-49 to an expected maximum daily sendout of 369,000 Mcf for the coming winter of 1953-54. This is an increase of 269% in five years.

It is evident that a great many network pressure calculations were required to ascertain that the reinforcements proposed for the distribution system would be adequate to meet expected peak loads. Even though the Hardy Cross Analysis Method was used in making pressure studies, some accuracy had to be sacrificed by employing short cuts in order to complete calculations in the time available.

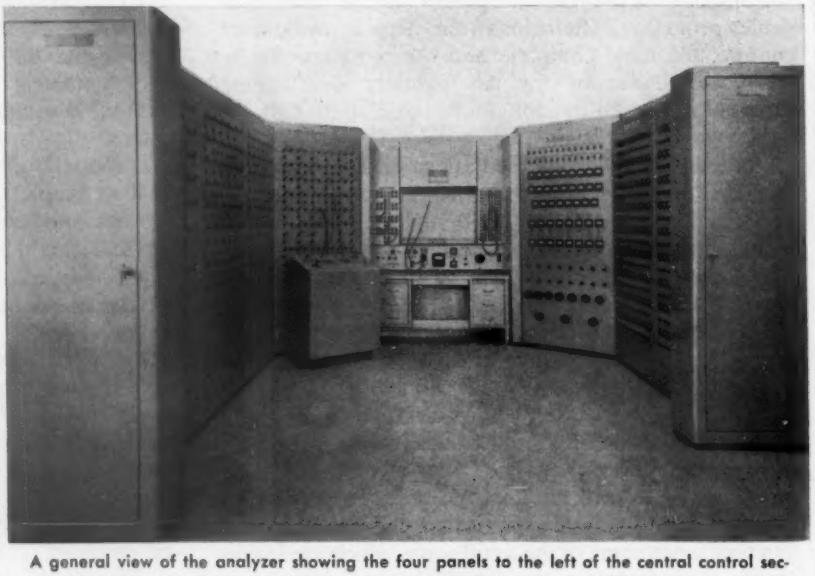
The use of the direct-reading network analyzer, developed by Dr. Malcolm S. McIlroy* and manufactured by The Standard Electric Time Co., seemed to be the best answer to the problem of keeping design calculations ahead of load acquisition.

It is the purpose of this article to discuss the practical application of the analyzer to gas distribution system problems. The principles of physics and mathematics upon which the analyzer is based, are ably presented in a paper, "Gas Pipe Line Networks Analyzed by Direct-Reading Electric Analogue Computor," prepared by Dr. McIlroy for the 1952 AGA Distribution Conference.

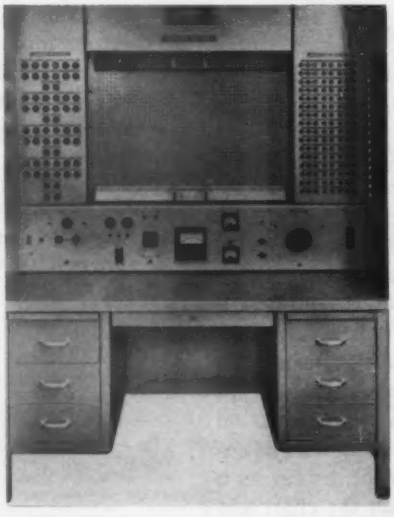
The success of this analyzer for solving fluid network problems lies in the special nonlinear resistance elements called fluistors. These fluistors automatically perform in a manner analogous to the behavior of fluid in the pipeline. It is thus possible to set up an electrical model of a pipe line network in which the current flow in amperes can be read directly in Mcf of gas per hour and the potential drop in volts can be read directly in pressure drop in inches of water for a low pressure gas distribution system. In medium and high pressure gas distribution systems, the voltage drop represents the difference in the squares of the initial and final absolute pressures in pounds per square inch. Even the factor for super-compressibility can be taken into account in the case of high pressure systems.

Employment of electronically-controlled constant current devices to represent the loads on the system eliminates the necessity of readjusting the loads for changes in flow and pressure conditions during the course of an analysis. Once the analyzer is set up for a given network, it is possible to explore and compare all proposed means of reinforcing the system in a very short time. It is also just a matter of adding or readjusting loading elements to study the effect of increased load on the system.

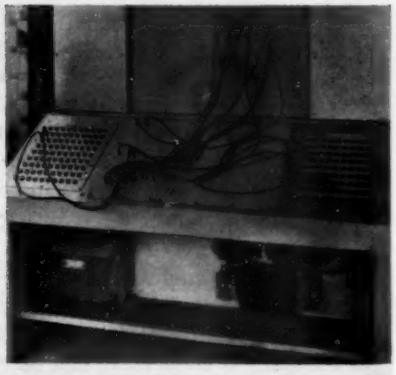
The analyzer is also a useful tool in solving operating problems connected with load dispatching. It is possible to determine rapidly what must be done to the system under emergency conditions, such as the loss of a supply point or the loss of an important feeder main by accident or shutdown for construction purposes. With the analyzer arranged so that each load element and each input source has its own ammeter, and with voltmeters available for intersource pres-



A general view of the analyzer showing the four panels to the left of the central control section which comprise the network section. By inserting fluistors in sockets in the rear of these panels the pipeline network is set up. The angle panel to the right of the control section is the source control. Inputs to the network are controlled from this panel. The two panels on the extreme right carry the electronic load controls. The rolling cart shown at the left of the desk carries the master ammeter and voltmeter used to take readings from network panels.



Below, a rear view of the control section shows the patching panels used to connect load elements to the proper points in network and to connect the map panel to network points. Left, a close up of the central control panel.



* Dr. Malcolm S. McIlroy is professor and assistant director, School of Electrical Engineering, Cornell University, and consultant to The Standard Electric Time Co., Springfield, Mass.; formerly, he was district superintendent for Central Hudson Gas and Electric Corp.

Design Calculations for Distribution System

sure difference readings, flow and pressure conditions on the entire system under study are instantly available to the operator. He can thus manipulate system conditions at will. He has, however, two important advantages over the load dispatcher. First, he does not have to wait for the load and can thus study present and future loads at his convenience, and second, he is never in any danger of losing the load on the system in case of error.

Our distribution system which serves 341,500 customers covers an area of approximately 130 square miles and contains 2,517 miles of pipe. About 65 square miles in the city of St. Louis and immediately adjacent suburbs are served by a low pressure network supplied by 130 district regulators. This low pressure system is supplied by a medium pressure system operating at pressures ranging from 3-to-25 psi. This medium pressure system has 11 supply points. The outlying suburban area is served by an intermediate pressure system operating at pressures ranging from 10-to-40 psi and is presently supplied at 12 points.

Our analyzer has a network of 490 pipe lines, 26 sources, and 180 load elements. The network section of the analyzer is a permanently wired grid so arranged that it can be made to represent any pipe network by inserting the proper fluistors in appropriate sockets. Fluistors are selected from a stock of approximately 1,000 covering a range of 200 sizes. The sizes are arranged in a preferred-number series so that each size of fluistor is approximately 5% greater than the one of next lower rating. Intermediate sizes can be obtained by parallel or series combinations of two or more stock sizes.

By using suitable demountable scales for the master ammeter and the master voltmeter, gas quantities and pressure drops are read directly in Mcf per hour and units of pressure drop respectively. We are thus able to study the suburban feeder network including all mains of 4 inches and larger as a single unit. We can also study the medium pressure system as a single unit. The low pressure system must be studied in sections comprising areas fed by one or more district regulators.

In order to gain both experience and confidence in our ability to operate the analyzer correctly, the first problem we set up was a check problem. Due to unusually mild weather, the actual peak load last winter was considerably less than our expected peak for zero weather. We used the peak load for the previous winter, which occurred on January 29, 1952. Since this load was somewhat less than the load used in a previously made calculation, we scaled down the individual load points in proportion to the ratio of the system totals. Due consideration was given to the variation of householeating saturation in the various load areas. We then set up the analyzer to represent the actual load experienced on January 29, 1952. The source controls were adjusted to bring flow and pressure conditions at the input points into agreement with the load dispatcher's record for that day. Flows and pressures over the system were measured and recorded. The pressures as determined by the analyzer were then compared to recording gauge charts from the files. The gauges record the pressure at district regulator inlets immediately ahead of the regulators which are located in underground vaults.

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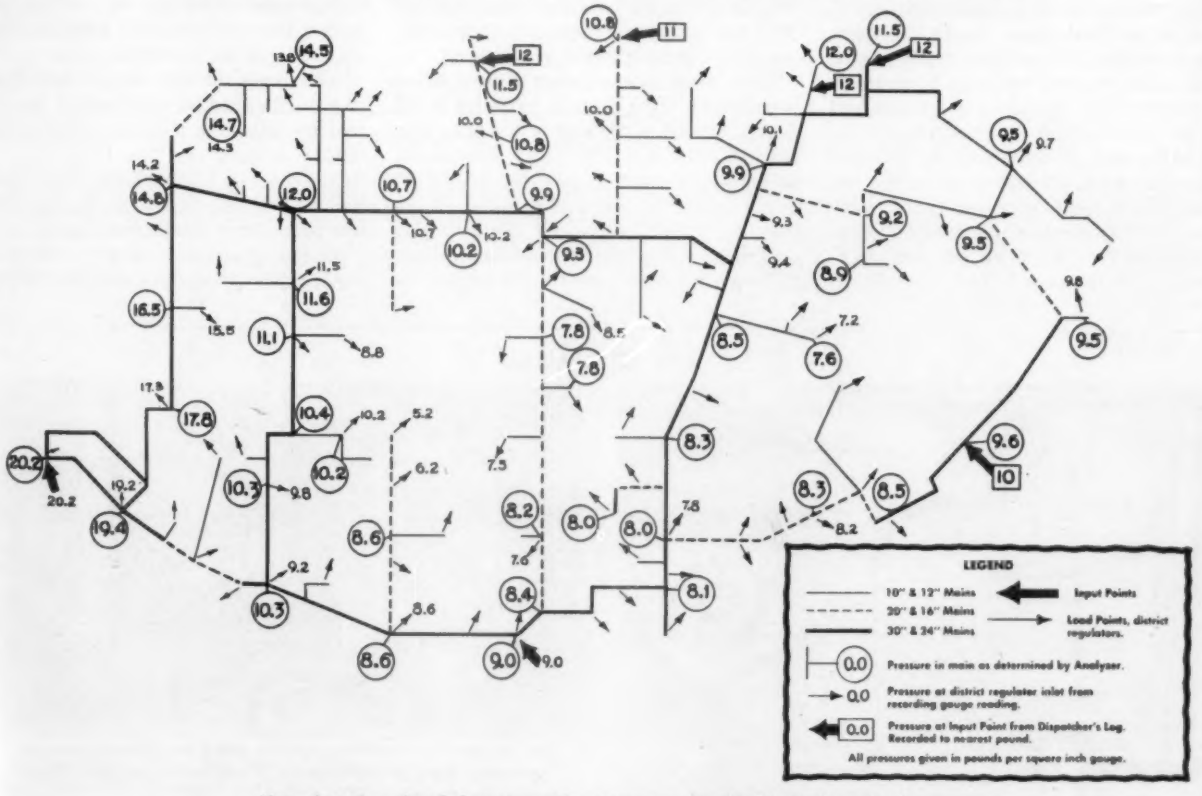
HOW ANALYZER COMPARES WITH ACTUAL PRESSURE MEASUREMENTS


LEGEND
10" & 12" Mains
20" & 16" Mains
30" & 24" Mains
Input Points
Load Points, district regulators.
0.0 Pressure in main as determined by Analyzer.
0.0 Pressure at district regulator inlet from recording gauge reading.
0.0 Pressure at Input Point from Dispatcher's Log. Recorded to nearest pound.
All pressures given in pounds per square inch gauge.

Map of portion of Laclede system with pressures as described in the legend, above.

LP Plants Have Future Use in Utility Systems

by John L. Turnan
Superintendent of Plants and Production
Worcester Gas Light Company

THE future of propane in the gas industry looks as good, if not better, than it has in many years. Propane plants are still being installed for cold enriching and for peak shaving in water gas or oil gas plants.

With the coming of natural gas to New England, a number of small plants that had been purchasing gas from larger utilities now find themselves on their own. In most cases these companies had no gas making equipment in their plant. Holders were their only standby, and not even those in some cases. With the increase in house heating their load factors are becoming poor and peak shaving becomes a necessity.

In plants where there are no storage facilities, even the hourly peaks have to be taken off the line. Under these conditions a small propane plant for peak shaving and for standby, in case of line interruption, is about the least expensive method from an investment standpoint.

The dependence on one supply line is another problem that should be taken into consideration in these small plants.

In some sections of large companies, extremely high pressures are being put on the distribution systems to get gas out to the ends of some lines or, to small towns of 10-to-12,000 meters. By the means of a small propane plant, with some modern control equipment, these peaks could be knocked off and additional loads taken on. For example, in our company a town 22 miles from our plant is having a rapid and tremendous development. We were forced to curtail the sale of house heating equipment for the simple reason that we could not get gas to this section.

High pressure holders were installed and in about two years if a long cold snap occurred we would exhaust the holders and would not have sufficient gas in the line to refill them. This station is located about 18 miles from the main manufacturing plant.

A small propane plant was installed, complete with a Selas Mixer and Fuller compressor, thereby taking care of the peak and making it possible to reduce the supply line pressure.

It is rather surprising how small a volume of gas is required to hold the line pressure over a few peak hours.

We have one small city, on the end of our line, that was always in difficulty on cold days. Following the installation of a propane plant it was discovered that in 80-or-90% of the cases, 5-to-10 Mcf per hour kept them out of trouble, and new business could be taken on.

This plant has a rather simple Selas installation. Five pounds pressure is all that is needed at the end of the line. The Selas Mixer has a 5 lb. blower connected to it and is started up on cold days. This unit cuts in and out as needed to maintain the 5 lbs. pressure. The gas just churns in the blower when not needed.

There has been considerable research work done, and is still being done, on catalytic cracking plants using both natural gas and also propane.

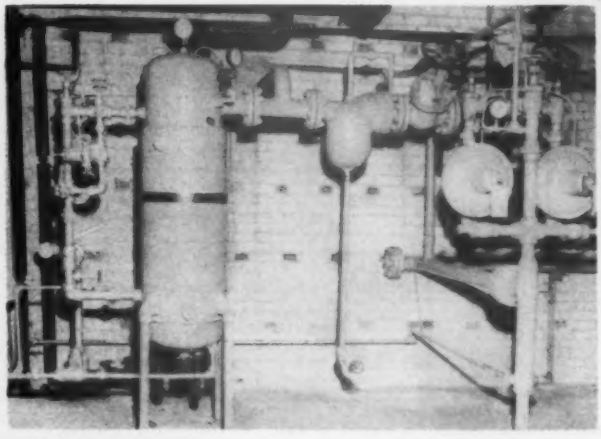
The purpose of catalytic cracking of natural gas is to obtain a gas of some desired hydrogen content. Many of the larger companies are now installing propane plants to be used in cat-cracking and also for cold enriching.

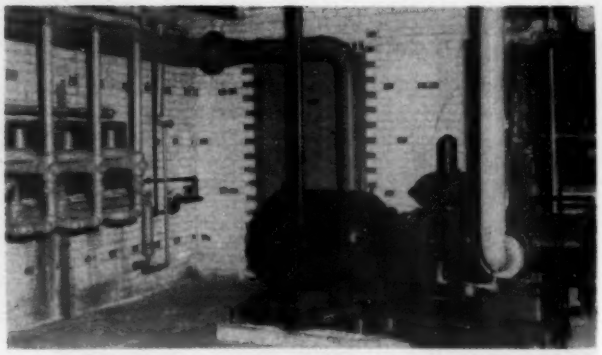
Some gas utilities are receiving natural gas from two different pipeline companies with two different heating values. This difference varies considerably and in some cases goes well over 1,000 Btu which is usually the base rate for the purchase of natural gas. In New England, the filed rates are based on 1,000 Btu per cubic foot. This gas is being delivered at times at 1,050 Btu or higher and the pipeline company charges for these extra Btu. Where the standard is 1,000 Btu, the extra 50 Btu either have to be cut back or given free to the customer. These free Btu could amount to from 4-to-7% in revenue. As a result, it becomes necessary to cut back the higher Btu to 1,000 with either catalytic cracked gas, air or other gases.

The Selas Mixer in our installation can be changed to any desired Btu-content by adjusting a screw which is calibrated directly on Btu. Currently, our mixer is set at 1,250 Btu to be used with our natural gas of 1,028 Btu, for either low pressure or peak shaving.

In our companies, we have been making a study of cutting the Btu in these

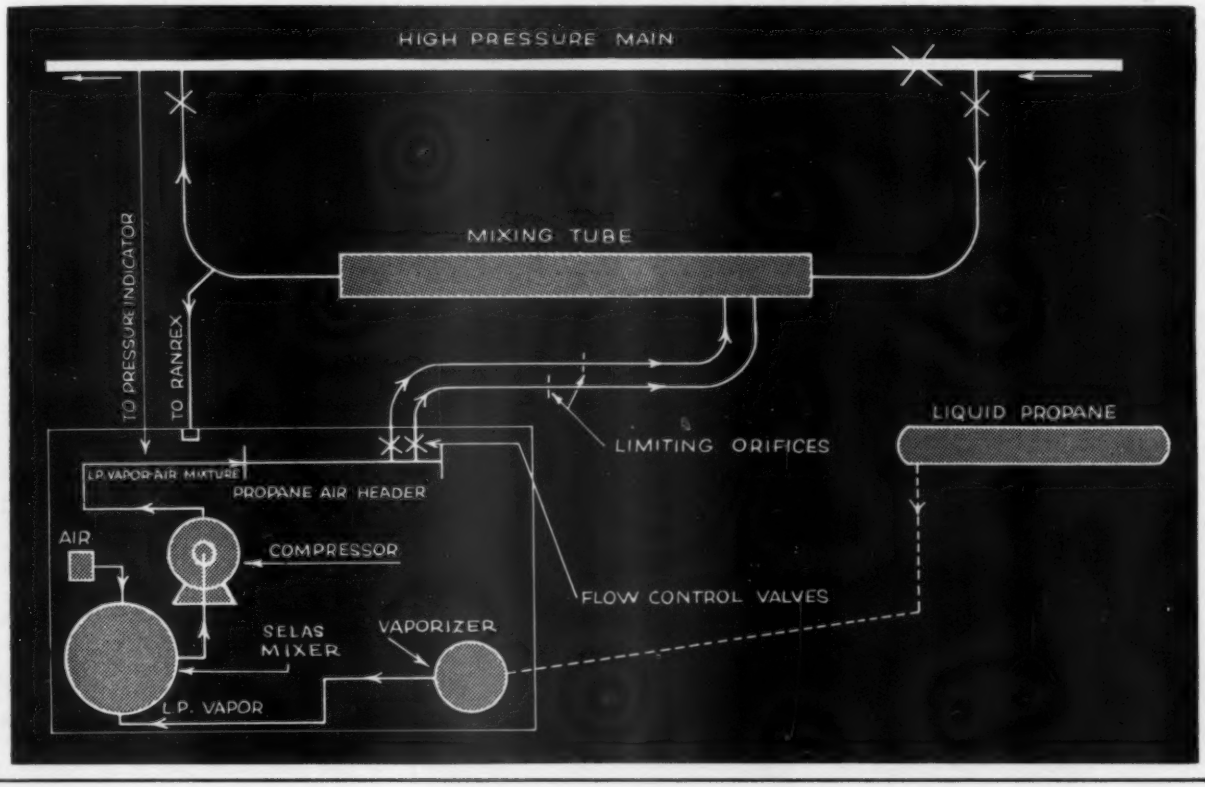
THE EQUIPMENT





Left, the propane vaporizer together with a first stage of pressure regulation. Right, a second stage of regulation, the Selas Mixer and Fuller compressor.

LP PLANT OF WORCESTER GAS LIGHT CO



gases, by use of catalytic cracked natural gas, which is high in hydrogen. Propane has also been used as catalytic cracking feed stock.

The orifices in our LP plant are applied as simple limiting devices for the pressures that are used. If these pressures are changed, the volume of gas passed would change and, in this case, the Ranarex would have to be watched more closely than usual. The Ranarex is used only as an operating guide and does not control any automatic equipment.

The use of catalytic cracked natural gas was first tried in the hope that this increase in hydrogen in the finished gas would help to solve the problem of slow ignition of natural gas. In cutting a gas with 1,050 Btu to 1,000 Btu, the finished gas would have about 5% hydrogen. To increase the hydrogen in the finished gas to about 10% or more the Btu value would drop below the standard 1,000.

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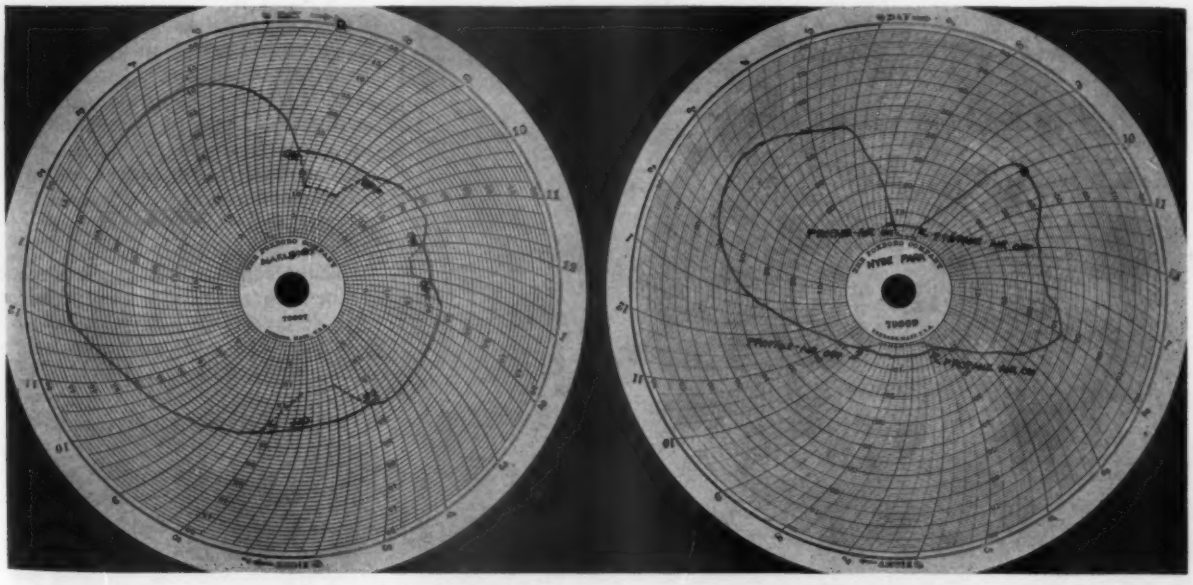
TYPICAL LP PLANT PRESSURE CHARTS IN UTILITY SERVICE



From two Worcester Gas Light LP plants, these charts indicate the effect of the propane-air additions. The minimum supply pressure for one plant, left, is 20 psig; the other is 5 psig. Dotted lines indicate probable pressures if LP plants were not available.

Electronic Equipment Simplifies and Speeds

FOR the past 24 years, Columbia Gas System has been watching with approval the invasion of its accounting departments by a series of increasingly clever robots that have made it possible to keep up with the growing demands on the accounting forces.

Columbia Gas System, one of the largest natural gas systems in the world, produces, transports and distributes natural gas to 1,250 communities in Ohio, Pennsylvania, New York, Kentucky, Virginia, West Virginia, Maryland and the District of Columbia. It includes 14 natural gas operating companies which are divided into three groups with headquarters in Pittsburgh, Pa.; Columbus, Ohio, and Charleston, W. Va.

In 1952, Columbia's 11,000 employees served an estimated population of 12,000,000 with 430 billion cubic feet of gas. The company owns about 10,000 gas wells and 1,500 oil wells and operates approximately 40,000 miles of pipelines.

From modest beginning, in the late-'20's, accounting mechanization has grown continuously and is still growing.

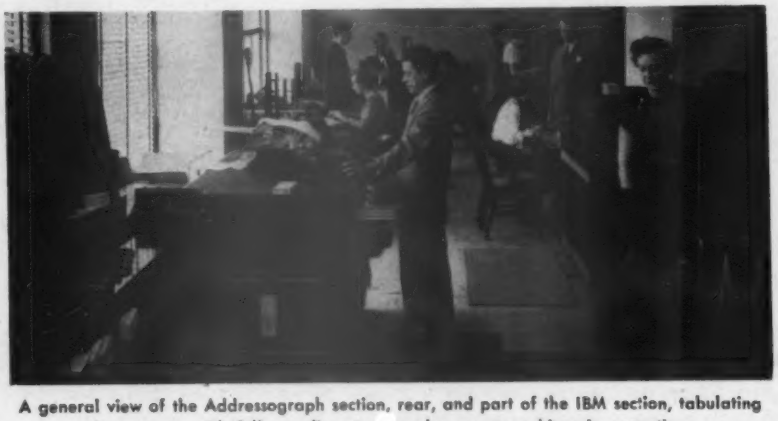
In 1929, hand-signing of checks gave way to the mechanical check-signer.

The first Addressograph machines for mechanically addressing customer bills were installed in 1928. These required the purchase of printed bill forms. In the early 1930's a big step forward was made in the purchase of machines which would both print the bill and address it in one continuous operation in the Columbus central addressing department.

In 1930 the use of Addressograph was extended to Columbia's lease rental check preparation. It was in 1929 that extensive research indicated the advantage of changing the system's hand-posted, Boston Ledger type of customer records to a key-driven, mechanically-posted, machine operation. During the next few years key-driven mechanization was extended to general accounting, gas measurement accounting, payroll, and accounts payable.

Columbia was constantly concerned with the work load involved in such volume jobs as customer billing and payrolls. When International Business Machines Corp. announced the development of machine features not hitherto available in their punch card equipment, Columbia's methods men quickly applied them to the biggest volume job, customer billing. In 1936, this operation was converted to IBM punch card machines.

The automatic reproducing punch Addressograph, the "9300," used in stockholder accounting. It was built to specifications developed by the Columbia methods department.



A general view of the Addressograph section, rear, and part of the IBM section, tabulating department, with full compliment of employees at machines in operation.

The electric punch card machines take care of volume and convert many diversified accounting routines to a single, well-defined production line operation. The IBM punch-card equipment is an advanced engineering achievement in the fields of electro-dynamics and electronics.

Mechanized accounting has saved Columbia Gas System substantial sums of money. Accurate figures are not available but the savings to date are estimated at many millions of dollars. Recently, mechanization of accounting and stockholder records work was completed in the New York office.

Prior to the change, detail work for the currently 92,000 stockholders was performed mainly by hand.

Before the machine age reached the stockholder records department, it was necessary to bring in extra workers on a part-time basis whenever dividends, proxies and other mass stockholder tasks were being prepared. Now, the mechanical equipment, which is ideal for doing large volumes of routine work at peak periods, has improved the condition of the records, the operation has been speeded up and is much more flexible, and the pressure of overtime work during peak periods has been eliminated.

Another result of the machine installations has been a five-day speed-up in completing the System's monthly consolidated financial report.

As bookkeeping throughout the System grew more detailed, through addition of pay-as-you-go taxes, Social Security, new customers, stockholders and employees records, statistics, and requirements of regulatory bodies, machine procedures were gradually developed and adapted to take care of the added accounting problems.

The mechanization has not resulted in the release of regular employees formerly doing the work on a manual basis, however. The machines have freed valuable accounting personnel for more important work or have reduced the number of new employees needed to handle additional work loads.

The shifting of accounting work loads to mechanized equipment has contributed to a number of employee benefits.

Columbia, through the constant research of its methods department, has pioneered in mechanical accounting. Not long ago, a new type of Addresso-

Columbia's Huge Accounting Operations

graph machine was installed in the tabulating department of the New York office for use in stockholder accounting. Built to include specifications developed by the Columbia Methods staff, the machine has been greatly admired by methods men, who have come from as far as New Zealand to see the "9300" in operation and to study its application in Columbia.

Columbia's IBM accounting system employs 160 machines. Of these, 33 are basic calculating and accounting machines and 127 are auxiliary machines such as sorters, summary punches, reproducers and collators.

The System has six separate IBM installations, all geared to similar, and in some instances, identical methods. Both the Pittsburgh and Columbus offices have separate general accounting and customer's billing departments. Charleston combines general accounting and customer's billing in one department. Stockholder and general accounting are handled in the New York office.

Each month these electronic wizards print amounts on approximately 1,200,000 customers' gas bills; they handle financial statement consolidation, trial balance and posting of ledgers for each of the companies in the System, and hundreds of Group financial reports, statistics and cost statements. Twice a month they prepare more than 10,000 pay checks and all related data. Every three months they take care of bank reconciliation of 92,000 stockholders' dividend checks—to say nothing of the phenomenal amount of additional work pertaining to stockholders and their 18 million shares that is turned out anually.

The customer's billing operation is only partially performed on IBM machines, which print only the amounts. The bill form itself and the customers' names and addresses are printed by Addressograph equipment, at the rate of 60,000 bills a day, in the centralized stationery and addressing department, and mailed to billing departments in the Groups, where the amounts are filled in.

The stationary and addressing department is one of the most modern plants of its type in the utility industry. All of

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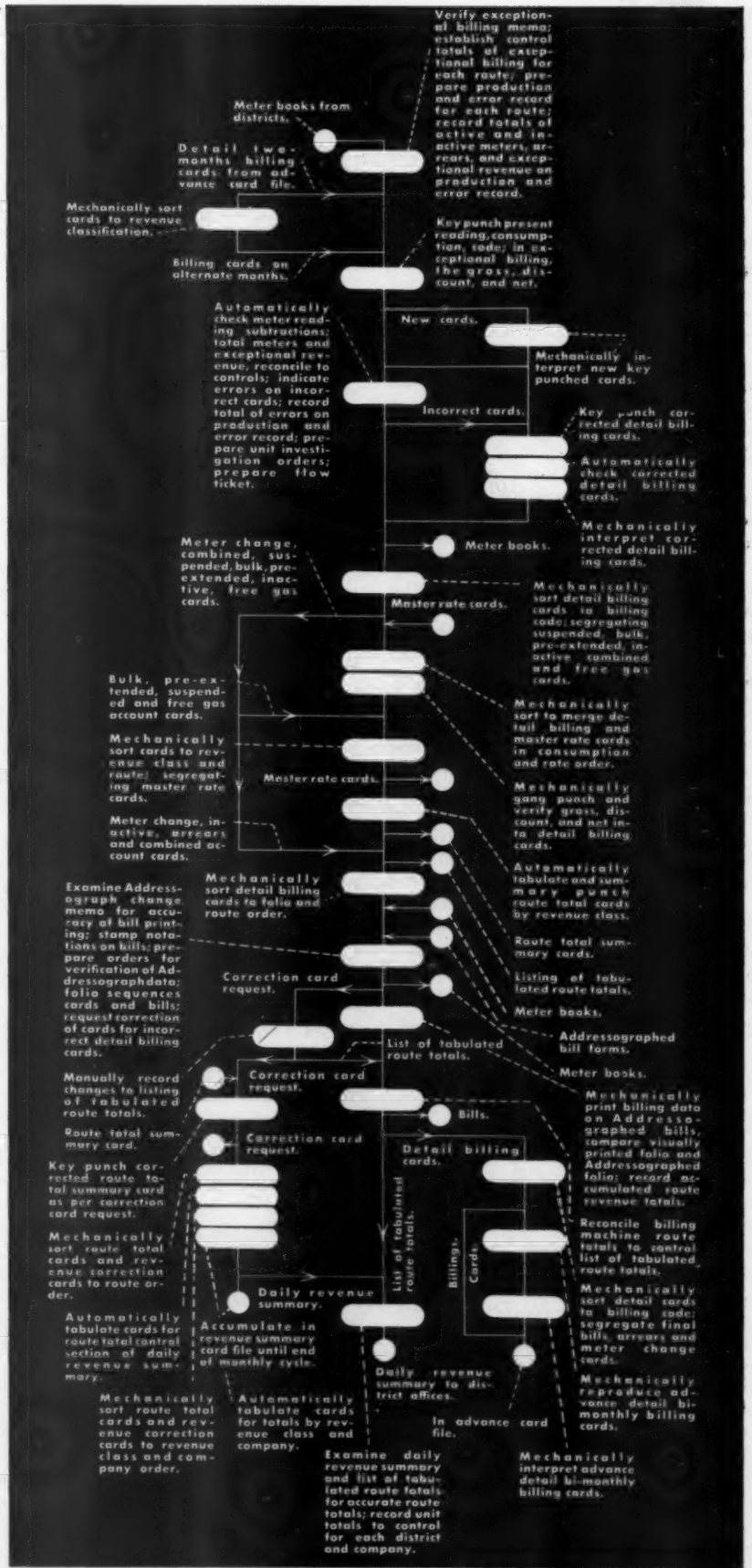
Verify exceptional billing memo; establish control totals of exceptional billing for each route; prepare production and error record for each route; record totals of active and inactive meters, arrears, and exceptional revenue on production and error record.
Meter books from districts.
Detail two-months billing cards from advance card file.
Mechanically sort cards to revenue classification.
Billing cards on alternate months.
Key punch present reading, consumption, code; in exceptional billing, the gross, discount, and net.
Automatically check meter reading subtractions; total meters and exceptional revenue, reconcile to controls; indicate errors on incorrect cards; record total of errors on production and error record; prepare unit investigation orders; prepare flow ticket.
New cards.
Mechanically interpret new key punched cards.
Incorrect cards.
Key punch corrected detail billing cards.
Automatically check corrected detail billing cards.
Mechanically interpret corrected detail billing cards.
Meter books.
Meter change, combined, suspended, bulk, pre-extended, inactive, free gas cards.
Master rate cards.
Mechanically sort detail billing cards to billing code; segregating suspended, bulk, pre-extended, inactive combined and free gas cards.
Bulk, pre-extended, suspended and free gas account cards.
Mechanically sort to merge detail billing and master rate cards in consumption and rate order.
Mechanically sort cards to revenue class and route; segregating master rate cards.
Master rate cards.
Mechanically gang punch and verify gross, discount, and net into detail billing cards.
Meter change, inactive, arrears and combined account cards.
Automatically tabulate and summary punch route total cards by revenue class.
Examine Addressograph change memo for accuracy of bill printing; stamp notations on bills; prepare orders for verification of Addressograph data; folio sequences cards and bills; request correction of cards for incorrect detail billing cards.
Mechanically sort detail billing cards to folio and route order.
Route total summary cards.
Listing of tabulated route totals.
Correction card request.
Meter books.
Addressographed bill forms.
List of tabulated route totals.
Meter books.
Manually record changes to listing of tabulated route totals.
Correction card request.
Mechanically print billing data on Addressographed bills, compare visually printed folio and Addressographed folio; record accumulated route revenue totals.
Bills.
Route total summary card.
Correction card request.
Detail billing cards.
Key punch corrected route total summary card as per correction card request.
List of tabulated route totals.
Billings.
Cards.
Reconcile billing machine route totals to control list of tabulated route totals.
Mechanically sort route total cards and revenue correction cards to route order.
Daily revenue summary.
Mechanically sort detail cards to billing code; segregate final bills, arrears and meter change cards.
Automatically tabulate cards for route total control section of daily revenue summary.
Accumulate in revenue summary card file until end of monthly cycle.
Daily revenue summary to district offices.
Mechanically reproduce advance detail bi-monthly billing cards.
In advance card file.
Mechanically sort route total cards and revenue correction cards to revenue class and company order.
Automatically tabulate cards for totals by revenue class and company.
Examine daily revenue summary and list of tabulated route totals for accurate route totals; record unit totals to control for each district and company.
Mechanically interpret advance detail bi-monthly billing cards.

TYPICAL WORK-FLOW IN CUSTOMER-ACCOUNTING BY COLUMBIA SYSTEM COMPANIES

Variety of Gas Utility Legal Questions Answered by Court Decisions

by Leo T. Parker
Attorney at Law
Cincinnati, Ohio

DURING recent meetings with gas company officials in the Eastern section of the country, conversations in many instances dwelt upon important laws and decisions involving gas companies.

A reader asked, "Is a city ordinance valid which taxes a gas corporation on the basis of its gross receipts?"

According to a late higher court decision, rendered only recently, the answer is yes.

For example, in Laclede Gas Company v. City of St. Louis, 253 S. W. (2d) 832, the testimony showed that a city imposed a license tax of 5% on a gas company's gross receipts from the sale of gas in the city. Testimony showed that as a public utility the gas company sells gas within the city. Under the statutes, the rates and charges of the company for gas sold to its customers are subject to the jurisdiction of an intervenor.

In subsequent litigation the higher court upheld the validity of the ordinance, and said: "The basic rule of construction of an ordinance or statute is to first seek the lawmakers' intention, and if possible to effectuate that intention. The law favors constructions which harmonize with reason, and which tend to avoid unjust, absurd, unreasonable or confiscatory results, or oppression. The very fact that the ordinance tax was fixed upon a percentage basis of gross receipts expresses a legislative intention to levy a tax which would be measured by the benefit to be realized by plaintiff (gas corporation) from its gross receipts from the sale of gas in the city. The ordinance does not levy a fixed tax arbitrary in amount, but instead levies one which of necessity would fluctuate with the volume of gas sold and with the benefit to be derived by plaintiff (gas corporation) as reflected by the value and amount of its gross receipts from gas sold in the city."

This court also explained the legal distinctions between tax on gross, and net receipts, by saying that the word "gross" as used in the ordinance, was there used as the direct antithesis of the word "net." In its usual and ordinary meaning "gross receipts" of a business is the whole and entire amount of the receipts without deduction. On the contrary, "net receipts" usually are the receipts which remain after deductions are made from the gross amount thereof of the expenses and cost of doing business, including fixed charges and depreciation. Gross receipts become net receipts after certain proper deductions are made from the gross.

"In the use of the words 'gross receipts,' the instant ordinance, of course, precluded plaintiff (gas corporation) from first deducting its costs and expenses of doing business, etc., in arriving at the base figure upon which it must pay the 5% tax under this ordinance," the court said. "The word 'receipts' appearing in the term 'gross receipts,' as used in the ordinance, connotes the monies received and taken in by plaintiff (gas corporation) from the sale of gas in the city, as distinguished from the monies paid out or expended."

Conservation Law

Another reader asked, "Is a state law valid which sets a wellhead minimum price for gas? Do the courts generally hold laws valid which are intended to conserve gas?"

Recently a court rendered an important decision to the effect that a state statute pertaining to the production and conservation of natural gas is broad enough to authorize the State Commission to make any rule or order to prohibit the waste of natural gas.

For illustration, in Northern Natural Gas Company v. State Corporation Commission, 222 Pac. (2d) 704, it was shown that a state passed a statute whose dominant purpose was to prohibit waste of natural gas, not only in the manner and under the conditions of its production, but for all purposes as would constitute waste. In order that the term "waste" should not be narrowly construed the statute makes it clear that it is to include economic, underground and surface waste. The statute also deals with the rights of owners of real property under which there is a common source of supply of natural gas.

In holding the statute valid, the court said, "We think the statute is broad enough to authorize the Commission to make any rule or order to prohibit waste of natural gas if the evidence discloses waste in the manner or conditions or purpose of its production."

With respect to the validity of a rule laid down by the Commission fixing the wellhead minimum price for gas, this court held, "We think the Commission was justified in finding upon the evidence before it that to prevent waste of gas in the field a minimum wellhead price of 8¢ per Mcf was justified."

Law of service pipes

During the course of a conversation with an official of a small town gas company, the question arose, "Can a gas company adopt a rule which requires and compels property owners to pay the cost of installing service gas pipes? Is the gas corporation relieved from liability for gas explosions where the gas leaked from service pipes owned by the gas consumer, or property owner?"

The question whether a gas company can compel its customers to lay or pay for service pipes often has arisen. Generally speaking, the courts have held that this cannot be done in the absence of statutory regulation. Moreover, where the franchise ordinance fixes the gas rates to be charged, mere rules and regulations of the gas company making such requirement have been declared to be unreasonable, unjust and unenforceable. See 168 Cal. 295; 163 N. Y. 158.

On the other hand, the law is well settled that a city ordinance authorized by a state law is valid by which the gas company may compel the consumer to stand the expense of laying service pipes. See 118 Ill. 329; 103 Wis. 225.

It is well known that the right of private gas companies to sell gas to consumers in any given community is dependent upon authorization of state laws. Of course, valid authority may be delegated to municipalities. In other words, the paramount rights of the public are exercised and controlled by the State Legislature. And not withstanding such laws gas companies may be liable for failure to use reasonable care to maintain equipment and pipe lines owned by consumers, if the testimony shows that the gas company had control of such equipment or service pipes.

For example, in Nord v. Butte Co., 30 P. (2d) 809, a city granted a franchise to a utility company to lay mains and supply service to the inhabitants. This contract was made by authority of a state law which authorized cities and towns to issue permits for use of its streets and alleys for installation of mains and equipment with the condition that the streets and alleys must be placed in as good condition by the company making the excavations, as they were before the excavation was made.

The question arose whether the utility

company was liable in damages for failure to keep the equipment and service pipes in good repair which, by contract, the consumer was required to install and keep in good condition. In holding the company primarily liable the court stated the following law:

"Under this statute the city had authority to grant the company the right to lay its 'pipes and mains,' and this 'carried with it the obligation to keep them in repair.' . . . By imposing upon the consumer the duty of keeping same in repair, the company but makes the property owner its agent for the performance of its public duty to maintain that instrumentality in repair. . . ."

In view of this decision, the law is established, "If by state laws a gas corporation is expressly or impliedly required to keep equipment and pipe lines in good repair, the corporation cannot avoid its responsibility by having the property owners or consumers sign contracts to keep same in safe condition and good repair. Also, whenever the gas corporation has control over equipment or service line and pipes it is obligated to keep same in safe condition, irrespective of contracts to the contrary made by either the property owners, or the city."

Damage in streets

"What rule of law can you supply to enable me to decide when a city is liable for injury to gas mains when its employees make street repairs?"

Modern higher courts consistently hold that when a city permits a public utility to install gas mains, or other apparatus, in the streets, the permit carries the implied authority of the city to construct and repair municipal improvements without being liable for damages to gas mains, and like apparatus in the streets, unless it is clearly proved that the injury resulted from negligence of the municipal officials.

Various courts have held that a city may without liability tear up its streets for making necessary improvements and, in the absence of state laws defining liability or negligence in performing the work, the city is not liable for payments of expenses or other damages sustained by gas companies, although the latter had received a permit and had a legal right at this time to use the streets.

In Louisville Company v. Commissioners, 33 S. W. (2d) 344, it was shown that the commissioners of a city considered the practicability of making an open ditch through a street for installing sewer pipes. However, since this would result in the interruption of traffic, the commissioners decided to construct a tunnel beneath the surface of the street. After the work was partly completed the soil beneath the street and above the tunnel sank at various points and certain pipes, mains and conduits of a gas corporation were caused to break. The company was required to make the necessary repairs at a considerable cost, and then sued the city for damages.

As the gas company did not prove that construction of the tunnel was carried on in a negligent manner, the higher court refused to hold the gas company entitled to recover damages, and said,

"Appellant (gas corporation) placed its pipes in the streets of the city, subject to the right of the public, through its proper municipal authorities, to make such use of the streets as might be necessary to protect the public health and safety. The city authorities could not by contract deprive the city of the power to make, in the future, such use of the streets as the public health or the public safety required, and the company took its rights under its franchise, subject to these limitations. . . ."

Two rate increases

Another reader raised the question, "Can a Public Service Commission approve two successive rate increases before the first rate increase became valid and effective?"

According to a late court decision, the answer is yes.

For illustration, in City of Saginaw v. Michigan Public Service Commission, 48 N. W. (2d) 133, the testimony showed: On March 25, the Public Service Commission filed an opinion and order finding that existing gas rates were confiscatory and directed the company to file rate schedules increasing its gross annual revenues from sales of natural gas by $1,800,000. On April 7, the gas company filed the required rate schedules in conformity with this order, together with an application for rehearing. On May 19, the rehearing was granted. On July 1, the commission filed an additional opinion and order authorizing the gas company to file rate schedules designed to further increase its annual gross revenues from sales of natural gas by another $1,161,000.

In subsequent litigation, the higher court held both rate increases valid, saying, "The commission being clothed, as it is, with statutory powers to fix rates in the first instance and to regulate them and thereafter to rescind, alter or amend any rate fixing order, and being vested with continuing power and jurisdiction over such rates which are, accordingly, always subject to commission revision, it is manifest that immediately following its order of April 7th approving increased rates, it would have been competent for the commission to have entertained a new rate case in the premises based on facts and circumstances arising after the previous hearing."

What is reasonable care?

"What rule of law have the courts formulated to determine whether a gas company's employees used 'reasonable' care in making installation of gas appliances in private dwellings to relieve the company from liability for subsequent injuries caused by occupants of the dwelling? If the owner of a dwelling uses defective appliances installed by a gas company's employees is the company relieved from liability for injuries caused by the defective appliances?"

Various courts have held that where a gas company agrees to install equipment or gas accessories in a private dwelling it is charged by law (1) with knowledge of the particular dangers characteristic of the instrumentality, and of the manner and means by which the danger or dangers are likely to eventuate into actual harm, and (2) with the duty to use that degree of care which is commensurate with the danger, and to guard or insulate against it.

Another important point of law decided by a late higher court is that no property owner is expected by law to inspect work done by a gas company's employees.

For example, the destruction of a dwelling and its contents, by fire, was caused by gas escaping from a gas appliance installed by the gas company's employees, six months previously. In Lone Star Gas Company v. Holifield, 150 So. S. (2d) 282.

The counsel for the gas company contended that the dwelling owner was guilty of contributory negligence by using the system for six months without attempting to repair the defects which caused the fire. However, the higher court held the gas company liable because the owner was not guilty of contributory negligence as he proved he had no knowledge of the defects. The court said that a property owner is not expected by law to follow up and inspect work by a gas company's employees.

Must prove injury

"If an employee is injured when working alone can he receive compensation under the State Workmen's Compensation Act?"

The answer is, yes, the employee is entitled to compensation under the State Workmen's Compensation Act, but he is obligated to prove that the injury was sustained while he was working within the scope of his employment.

The courts have adopted a rule that an employee who sues to recover compensation for an injury is bound to prove that he was injured while serving his employer. Otherwise the court will

(Continued on page 35)

FEDERAL POWER COMMISSION

FPC Settles New England Gas Market Controversy

The Commission has ended a five-year battle for the New England natural gas market, dividing it between Northeastern Gas Transmission Co. and Algonquin Gas Transmission Co., along lines of its original decisions of 1950-51. The final decision was based on a compromise proposed by the two distributors and their wholesale suppliers; Tennessee Gas Transmission Co. and Texas Eastern Transmission Corp.

The only changes in the original decisions are to transfer service to the Framingham division of the Worcester (Mass.) Gas and Light Co. from Northeastern to Algonquin; to transfer the Blackstone Valley Gas and Electric Co. of Pawtucket, R. I., from Algonquin to Northeastern, and to add some "fringe" markets in Maine, Massachusetts and New Hampshire to the Northeastern system.

Tennessee Now May Export Gas to Canada

The Commission authorized Tennessee Gas Transmission Co. and Niagara Gas Transmission Ltd. to export natural gas for ultimate consumption in the Toronto, Ontario, market area.

The opinion and order also authorize a transportation arrangement whereby Tennessee will transport natural gas from the southwestern United States for delivery to Iroquois Gas Corporation, of Buffalo, N. Y., at points in Pennsylvania and New York.

Under the export plan, Niagara will purchase natural gas in the Gulf Coast area for transportation by Tennessee to a point on the Canadian boundary near Niagara Falls, N. Y. The gas will there be delivered to Niagara which will transport it to the Toronto area where it will be resold to Consumers Gas Company for resale for ultimate public consumption. Niagara is owned by Tennessee and Consumers.

The Commission authorized Tennessee to deliver a maximum of 22,600 MMcf annually to Niagara; average deliveries will be approximately 62 MMcf daily. Tennessee will transport a maximum of 49,728 Mcf per day for Iroquois.

January-June Authorizations

During the first six months of 1953, FPC issued certificates authorizing the construction of natural gas pipeline facilities designed to add more than 2¼ billion cubic feet of daily delivery capacity to the nation's individual transmission systems.

Authorizations included 4,891 miles of pipeline, and covered new facilities having a total estimated construction cost of $548,982,510.

Of the total construction cost, major projects—those estimated to cost $700,000 or more each—accounted for approximately $542,313,993. These projects, when completed, will benefit 69 cities of 50,000 population or over in 19 states and the District of Columbia.

A $175,250,000 project by El Paso Natural Gas Co. was the largest single authorization during the first half of 1953. The Commission issued a certificate to El Paso authorizing it to build 722 miles of 30-inch transmission line from Texas to Arizona; 113 miles of miscellaneous 12¾ to 26-inch loop and sales lateral lines; 221 miles of supply laterals in Texas; and 161,860 horsepower in new compressor stations and existing main line and field compressor stations in Texas, New Mexico and Arizona. This project will increase the company's delivery capacity by 405 MMCF per day.

The certificates issued during the first half of 1953 bring total authorizations during the 12-month period ending June 30 up to 7-123 miles of pipeline and 582,715 horsepower in compressor units. Total estimated construction cost is $723,037,744. Major projects costing $700,000 or more authorized during this 12-month period accounted for $706,607,251 of this total, and included 6,684 miles of pipeline and 561,310 horsepower in compressor units. These larger projects will add more than 3¼ billion cubic feet of daily delivery capacity to the systems involved.

In the 11½ years since the present certificate provisions of the Natural Gas Act became effective, February 7, 1942, the Commission has authorized construction and operation of a total of nearly 53,000 miles of pipeline and approximately 3,900,000 horsepower in compressor units at a total estimated cost of more than $3,886,000,000.

Colorado Interstate to Increase Capacity

Colorado Interstate Gas Co. has been authorized to construct pipeline facilities in Colorado, Oklahoma, Texas and Kansas to increase the sales capacity of its natural gas transmission system.

The project, estimated to cost $19,856,596, will increase the capacity of the company's Rocky Mountain system by 82,500 Mcf per day, from the present capacity of 426,300 Mcf to 508,800 Mcf by the 1953-54 winter season.

The construction program includes 49 miles of 20-inch main line loop, and 18,920 horsepower at new or existing main line compressor stations. The project also includes a total of 35 miles of 12 and 16-inch pipe and 5,940 horsepower in supply facilities, 37 miles of 8 and 16-inch sales laterals, and approximately 112 miles of 4 to 20-inch field pipelines.

Digby Takes Oath as Commissioner

Seaborn Lee Digby, of Louisiana, has been sworn in as a member of the Federal Power Commission for the term expiring June 22, 1958. Mr. Digby, nominated to the Commission by President Eisenhower on July 28, was unanimously approved by the Senate Interstate and Foreign Commerce Committee on July 30, and unanimously confirmed by the Senate on July 31.

American Gas Fundamentals OUTLINE

NATURAL GAS
- *Geology
- *Drilling and completion
- *Methods of estimating reserves
- *Chemicals from gas
- *Natural Gas Conservation

MANUFACTURED GASES
- *Coke oven gas; producer gas, blue gas; carbureted water gas
- *Reformed gas
- *Hi-Btu oil gas
- Interchangeability

LIQUEFIED PETROLEUM GASES
- *Sources, properties and uses

BASIC GAS LAWS
- *Perfect gases
- Supercompressibility

TRANSMISSION
- *Pipe lines
- *Corrosion and pipe protection
- *Compressor stations
- *Gas conditioning
- Flow formulae
- *Principles of orifice measurement
- Pipe coatings and protection methods

GAS STORAGE
- *Methods of storing gas

GAS DISTRIBUTION
- *System design and operation
- *Pressure regulation, part 1
- *Pressure regulation, part 2
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- *Metering
- Measurement and accounting
- *Odorization
- Customer service

GAS UTILIZATION
- *Principles of gas combustion
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- *Competitive fuels, part 2
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CONVERSION PRACTICES

MANAGEMENT PROBLEMS AND POLICIES
- *Corporate structure
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- *Public relations
- Theories of rate making
- Rights-of-way

GLOSSARY
- *Ab-to-Gen

***Indicates chapters published since January 1, 1951; available without charge to new subscribers to American Gas Journal.**

How to Use the Material

American Gas Fundamentals *is a comprehensive compilation of basic gas facts to guide any gas utility employee toward a broader understanding of the industry as a whole.*

The series is designed to be removed from each current issue of AMERICAN GAS JOURNAL *and filed in a ring binder where it may be accumulated into a text book of permanent usefulness. Material should be filed under the major subject head appearing in the upper right hand box at the head of each chapter.*

Glossary of Gas Industry Terms: Gen to Inj

G—CONTINUED

GENERATOR A refractory-lined shell, the first vessel in a carbureted water gas set, in which blue gas is produced by alternately blowing air and steam through the fuel bed.

GENERATOR LINING Carborundum or fire clay brick lining in a water, or blue gas generator.

GEOLOGIST A scientist trained in the structure and development of the earth's crust and its composition.

GEOLOGY The science which treats of the earth with respect to the rocks of which it is composed and the changes which it has undergone or is undergoing. As a science, geology seeks to interpret currently-possible observations through theories or hypotheses regarding the origins of these rocks. These theories are of significance to the gas industry to the extent that their interpretation indicates underground deposits of gas or oil.

GEOPHONES Delicate devices used in seismographic exploration for gas or oil. Artificial earthquakes, produced by detonating charges of explosive in relatively shallow drilled holes, are recorded on continuously moving strips of paper as an array of the devices around the point of explosion pick up the shock waves.

GIRBOTOL PROCESS Removal of carbon dioxide and hydrogen sulfide from gas by washing with an amine solution.

GIRDER A large, horizontal, load carrying beam supported by vertical columns or walls.

GLOBE VALVE A spherical-bodied valve in which turning of the handle turns a threaded stem on which is mounted a disk which seats against an opening within the valve body to shut off flow through the valve.

GO-DEVIL A device with adjustable blades or brushes which is inserted in a pipeline and, as pushed by the flow of fluid in the pipe, scrapes foreign matter from the inner wall of the pipe as it goes. Also called a pig.

GONDOLA A railroad car, open at the top used to transport loose solid material such as coal or coke.

GOOSE NECK A device mounted at the top of each lift of a water-sealed gas holder opposite the guide frame column. The goose neck curves outward from the lift and carries a wheel which rolls on the guide column. Used to keep the gas holder tank centered as it floats on the water.

GOVERNING MECHANISM The operating components of a governor.

GOVERNOR Any device that controls the limits of an operating variable of a machine or process. In gas operation, a governor which maintains a predetermined level of pressure in a gas piping system is also called a regulator.

GOVERNOR HOUSE A building in which the governor is placed.

GOVERNOR STATION The point of location of the governor in a gas pipeline system.

GRAB BUCKET A round bottomed bucket of two hinged sections that is used on a crane to move loose materials. The hinged sections are opened and closed by the crane operator to pick up the dump material. Also known as a clam shell bucket.

GRADE The slope angle of a pipe, street, etc., from the horizontal. Classification according to some specific physical characteristic.

GRAHAM'S LAW The flow rate of a gas is universally proportional to the square root of its density.

GRAM CALORIE Amount of heat required to raise the temperature of one gram of water one degree Centigrade.

GRATE The rack or grid used to support burning solid fuel in a furnace.

GRAVITATION The molecular force with which bodies attract each other; generally considered as the attraction between a body and the earth.

GRAVITY API American Petroleum Institute index of weight of a unit volume of a liquid at 60° F.

$$\text{Degrees API} = \frac{141.5}{\text{Sp. gr. } 60/60^\circ \text{ F}} - 131.5$$

GRID The layout of a gas distribution system in a city or town in which pipes are laid in both directions in the streets and connected at intersections. A series of equally spaced parallel bars held together by equally spaced cross pieces; a screen.

GRIP An inverted cup or lip on the inside top edge of a section of a water-sealed gas holder. When an inside section rises, the cup on the outside bottom edge engages the grip on the next outer section to lift it up. Water in the cup supplies a gas seal, with the grip edge below the water level.

GROSS HEATING VALUE The total number of Btu produced by the complete combustion of a fuel when the products of combustion are cooled to the temperature of the atmosphere and the water vapor in the products of combustion is condensed to a liquid.

GUIDE FRAME A series of upright columns, suitably braced, to guide and control the rise of the sections or lifts of a water sealed gas holder.

GULF COAST DISTRICT The petroleum hydrocarbon producing area of the United States which borders on the Gulf of Mexico.

GUMS Resinous substances occurring in small amounts in manufactured gas and which interfere with the operation of regulators, meters and orifices.

GUN PERFORATOR A device for firing a bullet or several bullets through the casing, cement and producing formation of a well to provide channels for flow of gas and oil into the well.

GUSHER An oil well in which the oil is blown high above the ground surface by the gas pressure within the well.

H

HALF BEARING A bearing which covers only half the shaft which turns in it.

HALL PROCESS A fully regenerative and reversible process for making high Btu oil gas, consisting of two generator and super heater combinations which operate alternately, thus producing a continuous flow of gas. Designed by Edwin L. Hall.

HAMMER The knocking or pounding that occurs when liquid mixes with vapor in a pipe system.

HAND FIRING Supplying fuel to a furnace by hand control, such as shoveling solid fuel or using manually-operated valves to control the flow of liquid or gaseous fuel.

HANGER The jamming of coke in a vertical retort of a coal gas plant.

HARD ASPHALT Solid asphalt having a normal penetration of less than ten.

HARD CARBON BLACK Carbon black produced by the channel process.

HARD COAL Common name for anthracite coal.

HARD FLAME Gas flame to which an excess of air is supplied, generally in the primary air supply.

HARD WATER Water containing substantial quantities of dissolved calcium and magnesium salts.

HATCH Borrowed from nautical terminology, referring to an opening in the top of a tank to permit entrance of workers and ventilation; usually closed with a bolted down plate or door.

HEAD The differential of pressure causing flow in a fluid system; usually measured in height of a liquid column when applied to liquids.

HEAD UP To tighten the bolts on a hatch cover or manhole plate so that no leakage will occur from or into the vessel when operating.

HEADER A pipe or fitting that interconnects a number of branch pipes.

HEAT BALANCE The principle under which the amount of heat put into a system equals the heat going out of the system, either in utilization or loss. This is in accordance with a basic law of physics which states that energy cannot be created or destroyed.

HEAT CAPACITY Quantity of heat required to raise the temperature of a unit quantity of a substance one degree.

HEAT CONTENT The sum of the latent heat and sensible heat contained in a substance, above the heat contained at a selected zero condition of temperature and pressure; expressed as Btu's or calories per unit of volume or weight.

HEAT EXCHANGER A device for transferring heat from one fluid to another without inter-mixing the two fluids.

HEAT FLUX The rate of heat flow through a unit area of surface.

HEAT OF FUSION The heat lost or gained by a substance in passing from a liquid to a solid state or a solid to a liquid, at a constant temperature.

HEAT OF VAPORIZATION The heat lost or gained in a substance passing from a vapor to a liquid or a liquid to vapor, with no change in temperature.

HEAT OIL Fuel oil used to heat the equipment of an oil gas plant prior to making oil gas.

HEAT TRANSFER Flow of heat from one substance to another by radiation, convection or conduction. This term is sometimes loosely used to mean rate of heat transfer.

HEAT TRANSFER CO-EFFICIENT The quantity of heat transferred through a unit area of a material, in a unit of time and per unit of temperature difference between the two sides of the material.

HEATING OIL Any oil used as fuel.

HEATING VALUE The amount of heat produced from the complete combustion of a unit quantity of a fuel.

HEAVY END The higher boiling fractions of the feed to a distilling column which settle to the bottom of the column; the high boiling residue left from a distillation.

HEAVY OIL Heavy, thick and viscous oil weighing more than water per unit volume. These are usually residual oils of grades 5 and 6 and Bunker C.

HECTARE 2.471 acres.

HEIGHT OF TANK The maximum height in a storage tank to which it can be filled with liquid.

HELICAL GEAR A gear having straight teeth set at an angle to the center line of the gear shaft.

HELIUM An odorless, inert, gaseous element (He), specific gravity 0.1368. Produced from natural gas, largely in government-owned plants. Due to its lightness and noninflammability, it is widely used for filling lighter-than-air craft. Has 92% of the lifting power of hydrogen.

HERMETICALLY SEALED UNIT A term common in refrigeration, where the motor and compressor are sealed in an air-tight dust-proof housing.

HERRING BONE GEAR A gear in which the teeth are inclined in opposite directions from the center of the gear face and at an angle to the gear shaft. Also called a double helical gear.

HF ALKYLATION PROCESS A petroleum refining process for the production of alkylate in which hydrogen fluoride is used as catalyst.

HG, INCHES A pressure measuring unit of inches of mercury, equivalent to 0.491 lbs. per sq. inch.

HIGH BTU OIL GAS PROCESS A manufactured gas process in which oil is converted into a fuel gas having a higher heating value than that of coal gas or carbureted water gas. Often called Hi-Btu.

HIGH END POINT The high temperature of the boiling liquid at the end of distillation.

HIGH FIRE An expression for a maximum rate of fuel input to a burner.

HIGH-LOW A term for a type of heater control in which the main burner flame turns to a low position instead of going out when the controlled high temperature has been reached by means of the high flame.

HIGH PRESSURE GAS Gas at a pressure in excess of 2-to-5 pounds per square inch guage.

HIGH PRESSURE MAINS Gas distribution pipelines carrying gas at a pressure greater than 2-to-5 psig in a high pressure gas distribution system.

HIGH SPEED STEEL A steel used for cutting tools which remains hard at high temperatures and hence can be used at high speeds.

HIGH TENSION A high voltage and low amperage condition of electric current.

HIGH VOLATILE COAL Coal containing a relatively high percentage of distillable hydrocarbon liquids which can be converted to gas as in the coal gas process.

HIGHER HEATING VALUE The total heat of combustion of a unit quantity of a fuel at 60° F, with the products of combustion cooled to 60° F. Also known as gross heating value.

HIT In petroleum and gas drilling, to get production or a well which has been drilled into production.

HOLDER (See Gas Holder.)

HOLDER PRESSURE The gas pressure at the outlet of a gas holder.

HOLDER STATION The location of a gas holder on a gas distribution system with the operating controls of the holder generally placed in a suitable building nearby.

HOLD-UP BARS Bars driven into the fuel bed of a water gas retort, just above the clinkers, to hold up the fuel bed while the clinkers are removed.

HOLE The bore of a well.

HOLIDAY A break in the anti-corrosion coating of a pipeline, which leaves bare pipe exposed.

HOLIDAY DETECTOR An electronic device for locating holidays in a pipeline coating.

HOOT OWL The midnight to 8:00 A.M. shift of work; also called graveyard and hoot owl tour.

HOPPER A cone or funnel-shaped bin or container used to load materials into a small opening, conveyor belt or carrying car.

HORIZON Oil- or gas-bearing rock strata.

HORIZONTAL BOILER A boiler in which the shell and its internal tubes are placed in a horizontal position. Either water or hot flue gases may pass through the tubes.

HORIZONTAL ENGINE An engine in which the cylinders are in a horizontal position.

HORIZONTAL RETORT A piece of equipment for the manufacture of coal gas in which the long axis is horizontal.

HORSEPOWER (HP) A unit for measuring power; equivalent to 33,000 foot pounds per minute or 550 foot pounds per second.

HORTONSPHERE The trade name for spherical type of high-pressure holder, named for its designer George T. Horton, used for storage of highly-volatile liquids.

HOT AIR CIRCULATOR A type of unit space heater, usually suspended from the ceiling, in which a fan blows air over tubes heated by steam or hot flue gases passing through them. This type of heater is generally used in commercial and industrial applications.

HOT JOB One that must be done in a hurry.

HOT OIL Oil produced in excess of proration allowable, set by a state regulatory or conservation commission.

HOT OIL OPERATOR A lease operator who produces oil in excess of the daily production allowable under the state commission orders.

HOT PLATE A small, one- or two-burner gas or electric cooking stove consisting of the burners in a simple frame with grids over the burners to support pots and pans.

HOT REFLUX Reflux returned to the top of a distillation column at the temperature maintained at the top of the column.

HOT SPOT An area of a combustion chamber which is at a higher temperature than the surrounding area due to either direct flame impingement or a deposit which prevents the even flow of heat at that point.

HOT WELL A container or tank in which hot water from a condenser accumulates and is drawn off.

HOTHOUSE A building which houses the channels and burners in the channel process of making carbon black.

HOUDRY PROCESS A catalytic cracking process for refining petroleum invented by Eugene J. Houdry.

HOURLY PEAK The maximum demand for gas from a transmission or distribution system in any hourly period of time.

HOUSE BRAND A product of a company bearing a trademarked name of that company, such as gasoline produced by a particular refining company.

HOUSE GOVERNOR A pressure regulator located at customers' meter settings.

HOUSE SHUT-OFF A valve or cock, hand operated, placed in a gas customer's service line, ahead of the meter and used to turn off the gas.

HOUSING The enclosing case or cover around a machine or machine part.

HP Abbreviation for horsepower; also, sometimes used for high pressure.

HUMIDIFICATION CONTROL A device for controlling humidifier operation to maintain a desired and preset relative humidity.

HUMIDIFIER A mechanical means of increasing the relative humidity to a preset percentage in a closed chamber by injecting water vapor in air.

HUMIDISTAT The part of a humidification control which measures the relative humidity and opens or closes electrical contacts which actuate the humidifier.

HYDRATED LIME Calcium hydroxide, an ingredient used to thicken the special mud that is used in well-drilling.

HYDRAULIC A general term referring to fluids in motion.

HYDRAULIC CYLINDER A device in which liquid under pressure moves a piston within a cylinder to produce force.

HYDRAULIC FLUID A liquid, used in hydraulic systems, that has low pour-point, low viscosity and small variation of viscosity with temperature.

HYDRAULIC JACK A jack in which movement is effected by pressure of a liquid.

HYDRAULIC MAIN A collecting main from a coal gas reretort. The main is partially filled with water which condenses some of the tars and ammonia from the gas.

HYDRAULIC RADIUS The cross-section area of a fluid flow path divided by the perimeter of the path.

HYDRAULIC SYSTEM A system comprised of a pump, pressure tank, piping, valves and one or more hydraulic cylinders, usually automatically controlled, which serves to operate one or more pieces of mechanical equipment by the pump pressure acting through the hydraulic cylinders to move the operating mechanism of the mechanical equipment.

HYDROCARBON A chemical compound composed solely of carbon and hydrogen. The compounds having a small number of carbon and hydrogen atoms in their molecule are usually gaseous; those with a larger number of atoms are liquid and the compounds with the largest number of atoms are solid.

HYDROCOL PROCESS A catalytic process for production of gasoline and other chemical products from natural gas, crude oil, fuel oil or coal.

HYDROGEN A colorless, odorless, highly inflammable,

gaseous element (H) used in hydrogenation of petroleum and for producing ammonia. Also, an important constituent of manufactured gas.

HYDROGEN SULPHIDE A compound of sulphur and hydrogen, gaseous in its natural state. It is found in manufactured gas made from coals or oils containing sulphur, and must be removed. It is also found to some extent in some natural gas and again must be removed. It is characterized by having the odor of rotten eggs.

HYDROGENATION A refining process in which oil is decomposed at high temperature in the presence of hydrogen and a catalyst to produce gasoline fractions from the oil.

HYDROGRAPH A clock-driven device which continuously records the humidity of the atmosphere around it.

HYDROMETER An instrument for determining the specific gravity of a liquid. When floated in the liquid, the gravity is read directly by a scale marked on the stem of the instrument, at the level of the liquid surface.

HYDRONS Containing water in chemical combination.

HYDROSTATIC SQUEEZE TEST A test of equipment in which the item of equipment is filled with liquid under suitable pressure and then shut in. If there is no loss of pressure during a stated period, the system is free of leaks.

HYGROMETRY The measurement of the percentage of moisture in air, from which the relative humidity may be determined.

I

IDEAL GAS A gas which conforms in behavior to the gas laws.

IGNITION Starting combustion.

IGNITION ARCH A refractory brick arch which stores heat to ignite any combustible gas flowing into the carburetor of a carbureted water gas set, during the preparation or blow period of operation.

IGNITION TEMPERATURE The temperature at which a combustible substance will start to burn and continue burning with a normal supply of air.

IGNITION VELOCITY When the rate of flame propagation of a given gas-air mixture is determined by burning the mixture in a one-inch tube, the ignition velocity is approximately one-half the rate of flame propagation. It equals the rate of flame propagation as determined by the inner cone method.

IHP Indicated horsepower.

ILLUMINANTS The group of hydrocarbons in a manufactured gas, such as ethylene and benzene, which burn with a luminous flame.

ILLUMINATING GAS Natural or manufactured gas burned in a jet with a deficiency of primary air to produce a luminous flame for lighting.

IMMISCIBLE Non-mixable liquids, such as oil and water.

IMPACT HEAD The operating pressure of a fan or blower and equal to the sum of the velocity head and static pressure of the gas discharged.

IMPELLER The rotating part of a blower or centrifugal pump which forces the fluid through the housing of the equipment. Also, the blade assembly of a fan.

INACTIVE BLACK Carbon black having a low absorptive capacity.

INCANDESCENCE That condition of a heated substance which results in the radiation of heat and light.

INCANDESCENT MANTLE The light producing element in a lamp in which a flame heats a chemically-impregnated knitted mantle or bag, mounted over the burner, to incandescence.

INCH OF MERCURY A unit of pressure in which one pound per square inch equals 2.036009 inches of mercury column.

INCH OF WATER A unit of pressure in which one pound per square inch equals 27.68049 inches of water at 4° C.

INCLINED RETORT A coal gas generating retort with the long axis set at an angle from the horizontal, but not vertical.

INCLINOMETER In drilling of gas and oil wells, an instrument for measuring the deviation of the hole from the vertical.

INCOMPLETE COMBUSTION Burning with an insufficient supply of oxygen so that the burning substance is only partially consumed and could be burned further with additional air supply.

INDEPENDENT Applied to the oil industry, any small company, group or individual, operating in a single branch of the industry.

INDEX A general term for a measure; also applied to the mechanism, composed of gears, dials and dial face, which indicate the quantity of gas passing through a meter.

INDEX BOOKS Another term for meter books.

INDICATED HORSEPOWER In engines, the total horsepower development.

INDIRECT FIRING A method of heating a coke oven or coal gas retort by drawing producer gas mixed with air into flues and burning it there so that the heat of combustion is supplied directly to the walls of the ovens or retorts.

INDUCED DRAFT Air draft through a boiler or furnace caused by a fan, set in the flue of the equipment, which sucks the air through the combustion chamber and sucks the flue gases out.

INDUSTRIAL SERVICE Gas service to customers who create a product or modify raw or unfinished materials into another product, or who extract raw materials from the earth.

INERT Not acted upon chemically by the surrounding environment. Nitrogen is an inert constituent of fuel gases; it dilutes the gas and does not burn itself.

INFLAMMABILITY LIMITS The maximum and minimum concentrations of fuel in a fuel-air mixture at which the mixture will burn.

INFLAMMABLE SOLVENT A solvent having a flash point less than 100° F.

INGAA Abbreviation for Independent Natural Gas Association of America, an organization of producers and transporters of natural gas.

INHIBITOR Any substance or material which retards or stops a chemical reaction.

INITIAL BOILING POINT The temperature of the vapor in a batch distillation column when the first drop of liquid falls from the condenser.

INJECTED GAS Gas returned to a producing sand for storage or for maintenance of oil reservoir pressure.

INJECTION WELL Same as input well.

The Glossary of Gas Industry Terms, of which this is the fourth installment, is being compiled by Robert M. Poe.

Steady Bond Market is Anticipated

But With Higher Interest Cost Than Last Year

by John F. Falvey

Financial Editor

John F. Falvey

CONTRARY to widely held expectations in numerous financial quarters early in the year, it now appears that utility industry financing of all types in the calendar year 1953 may duplicate the $3.3 billion brought to market in 1952. During the initial six months, utility financing totaled $1.6 billion. The recently announced $625 million convertible debenture offering of American Telephone & Telegraph Company is expected to bring telephone industry financing in the final half year to about $700 million, the electric utilities probably will need around $900 million and the gas companies approximately $500 million.

Both the bond and stock markets seem to have taken the ATT financing announcement in stride, and underlying economic factors suggest that a steady bond market is in prospect, albeit at a considerably higher interest cost than prevailed a year ago. Yields on first grade corporates now are 8% above the 1952 year-end level, and the return on second and third grades is approximately 10% and 12% higher, respectively.

At long last, Federal Government expenditures are being held in close check. While projected expenditures of $74.1 billion are $5.6 billion above estimated tax payments, the deficit on a cash basis is expected to be less than $3 billion; and only a relatively small change in expenditures and receipts could bring the cash budget into balance or close to it. Furthermore, stress now is being placed on drastically reducing Government expenditures and overhauling the tax structure to bring both receipts and disbursements to smaller and more manageable levels, as well is in closer balance.

Demand for bank credit will be of only seasonal proportions over the months ahead and savings are likely to fill a larger part of other demands for funds. Deposits in mutual savings banks in the first half of 1953 increased at a rate of $2 billion annually—a gain of 15% over the similar 1952 period, for the greatest rise in at least seven years—and savings in savings and loan associations gained at an annual rate of $3.5 billion. Time deposits in commercial banks still are growing at a yearly rate of more than $2 billion and the increase in life insurance company resources, premiums plus earnings of the companies, are running at a $5 billion yearly rate, also the best gain in seven years.

In addition, as competent bond market observers point out, growing confidence in the dollar is manifesting itself in the excess of sales of Series E and H savings bonds, over redemptions; Treasury needs for the balance of the year are well-known; the Federal Reserve authorities, while not eager to stimulate the bond market, will supply reserves to take care of the usual rise in currency toward the end of the year; and federal spending in the current fiscal year may be $2 billion less than forecast, which also would exercise a stabilizing influence in the money market.

A glance at the record supports the recent observation of one of the Federal Government's chief economists that we are operating pretty much at capacity for "peacetime." The nation's business produced goods and services in the second quarter of 1953 at an annual rate of $372 billion, and the national product for these three months brought to $367 billion the average annual rate of output for the first half of 1953. This compares with $348 billion recorded in 1952.

Contributing to the gain was increased spending by individuals, business and the government, as well as substantial enlargement of inventories. After slashing their inventory purchases from an annual rate of $8.1 billion in the final quarter of 1952 to only $2.9 billion in the initial quarter of 1953, the nation's corporations jumped inventory purchases in the June 1953 quarter to an annual rate of $8.8 billion.

Earnings have kept pace with the rising trend of output. A tabulation of 550 corporate earnings reports for the first half of this year indicates that net income ran about 17% higher than in the similar 1952 period. Figures compiled by the National City Bank of New York indicate that corporate net income in the June quarter of 1953 was 26% ahead of the first half of 1952, that second quarter earnings bettered the March quarter results by 8%, and that more than two-thirds of the companies covered in its survey had better earnings in both the second quarter and in the first half-year.

Many companies already have earned

(Continued on page 36)

INDEX OF YIELDS : SELECTED UTILITIES STOCKS

	Aug. 1953	July 1953	June 1953	May 1953	Apr. 1953	Mar. 1953	Feb. 1953	Jan. 1953	Dec. 1952	Nov. 1952	Oct. 1952	Sept. 1952
Natural Gas Transmission Companies	4.46%	4.76%	4.72%	4.34%	4.18%	4.04%	3.95%	4.04%	4.04%	4.14%	4.48%	4.44%
Natural Gas Transmission & Distribution Companies	5.13	5.41	5.55	5.28	5.06	4.91	4.91	5.02	4.99	5.14	5.47	5.45
Manufactured & Mixed Gas Companies	4.99	5.06	5.08	4.80	4.73	4.63	4.65	4.87	4.83	5.00	5.04	4.80
Class "A" Electric Companies	5.27	5.41	5.53	5.18	5.14	4.97	5.05	5.08	5.10	5.20	5.40	5.39
Class "B" Electric Companies	5.50	5.41	5.68	5.35	5.06	4.93	5.08	5.19	5.08	5.19	5.47	5.42

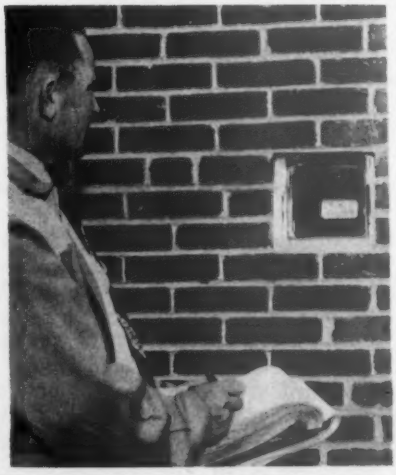
This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

This index is compiled from: natural gas transmission companies, 5; natural gas transmission and distribution companies, 5; manufactured and mixed gas companies, 4; class "A" electric companies, 4; class "B" electric companies, 5.

News of the Gas Industry



N. J. CO. USING GLASS BLOCKS FOR OUTSIDE METER READINGS

Public Service Gas and Electric Co., New Jersey, has employed something new in the taking of outside meter readings. The company has been mounting gas meters directly behind and facing a glass block installed in an outside wall of the home. The transparent block, manufactured by Pittsburgh Corning Corp., lets the meter reader take readings without ever entering the house. Public Service estimates that by taking readings through the transparent block their readers can take many more readings in a day.

The glass block is 8" square, and 4" thick with smooth clear faces for good vision. The blocks are strong and, being hollow, have an insulating value equal to an 8" masonry wall.

UNITED FUEL APPLIES FOR REHEARING ON FPC ORDER

United Fuel Gas Co., a Columbia Gas System subsidiary, has asked for a rehearing on the widely-publicized recent Federal Power Commission order which, FPC said, would give United Fuel a 6¼% rate of return.

Stuart M. Crocker, chairman of the board, and George S. Young, president, The Columbia Gas System, Inc., said early this month that a careful study of the 68-page FPC order shows that the rates prescribed will produce not a 6¼% return, when applied to United Fuel's estimated 1953 sales, but only 3.69%.

In asking for a rehearing and stay of execution of the order, United Fuel said it contained substantial errors in computation. If carried out, Columbia officials stated it would have a tremendously adverse financial effect not only on United Fuel but on The Columbia Gas System, Inc. It is estimated that the ultimate net effect of the order on the System's consolidated earnings for the year 1953 will be to reduce those earnings by nearly $2,700,000.

"Results such as these," they stated, "were not the results which we believe the Commission intended to produce."

The application states that while the language of the Order relating to rate of return is quite realistic and sympathetic to the needs of United Fuel, the statistics introduced by a Federal Power Commission staff witness, and to which the Commission's analysis was applied, are highly misleading.

Major points on which United Fuel based its request for rehearing include:

1. There was error in reducing United Fuel's rate base by $3,700,000.

2. The allowance for annual operating expenses was erroneously reduced by about $2,000,000. This results from an assumption that United Fuel would produce at no additional cost, except depletion, more gas from its own wells than it believes advisable.

3. The computation of income taxes was incorrect.

4. The depreciation rates prescribed by the order are without support.

5. The method of allocation of costs is arbitrary and unreasonable and injurious to the financial position of United Fuel.

6. The prescribed rate form is contrary to the interests of consumers and investors and usurps the rights of management.

The application cites 18 points of contention between the company's management and the FPC staff and stated that in only one of these did the order accept management's conclusion over that of the staff.

John Wood Buys Floyd-Wells

The John Wood Co., Conshohocken, Pa., has purchased the Floyd-Wells Co., Royersford, Pa., manufacturers of gas and combination ranges. John Wood produces automatic water heaters, gasoline pumps, service station equipment, metal dairyware, tanks and storage vessels of various types, in nine plants throughout the U. S. and Canada.

The merger unites the two old Pennsylvania companies into a new and greatly strengthened organization. John Wood was established in 1867 and the Floyd-Wells Co. in 1883.

John Wood officials say that there will be no change in supervisory personnel now engaged in operation of the Floyd-Wells Co. Bengal, the brand name of the range, will be maintained and promoted.

Make Millionth Robertshaw Model B

Headed by Wilbur Jackson, assistant vice president, officials of Robertshaw-Grayson Controls Co. during June marked production of the company's 1,000,000th model B Unitrol Junior thermostat for automatic gas water heaters during ceremonies at the Grayson division plant, Lynwood, Cal.

Completion of the one-millionth model came only one year and a half after the model's first casting went into production. It marked, too, the end of a six month period during which production of the model equalled the entire first year's output.

Hugh H. Cuthrell

Hugh H. Cuthrell, president and chairman of the board, The Brooklyn Union Gas Co., died August 31, at the age of 60.

Hugh H. Cuthrell

In addition to holding the top posts at Brooklyn Union, Mr. Cuthrell was prominent nationally in the gas industry. He had served as president of American Gas Association in 1949-50, had been a member of the Gas Industry Advisory Council of the U. S. Interior Department and was a past president of the Society of Gas Lighting.

In 1952 Mr. Cuthrell played an important role in the huge project that was undertaken by his company to convert to natural gas from Texas and Louisiana.

Born in Winston-Salem, N. C., he attended Wake Forest College and was graduated from the University of North Carolina. He entered The Brooklyn Union Gas Co. in May, 1927 as an engineer's assistant, and filled various positions until he was elected president of the company in September, 1951. He added the duties of chairman of the board in September 1952.

Mr. Cuthrell was very active in civic and charitable organizations in addition to his manifold business activities.

Frank J. Haas

Frank J. Haas, former vice president and general manager of Southern Indiana Gas and Electric Co., died August 14, at the age of 76.

Mr. Haas relinquished his executive duties with the company in 1934, since which time he has been engaged in civic activities.

Daniel S. Keenan

Daniel S. Keenan, president, Carnegie Natural Gas Co. and of Apollo Gas Co., died in Pittsburgh, September 8, at the age of 59.

A native of Clarksburg, W. Va., Mr. Keenan had been head of the two United States Steel Corp. subsidiaries for the past 15 years.

He also was president of the Engineers Society of Western Pennsylvania, and a director of the Pennsylvania Natural Gas Men's Association.

Before joining Carnegie and Apollo, Mr. Keenan was with United Carbon Co., Charleston, W. Va., and the Pittsburgh and West Virginia Gas Co.

Reports on Industry Progress A Feature at AGA Convention

Reports on the progress and latest developments as well as the future plans of the unified utility and gas appliance industry will be presented by industry leaders at the thirty-fifth annual convention of American Gas Association in St. Louis, October 26-28, Robert W. Otto, president of Laclede Gas Co., and chairman of the general convention committee, reports.

The advancement of the Gas Industry Development Program will be discussed from the utility viewpoint with a report by Frank C. Smith, president, AGA, and president, Houston Natural Gas Corp., from the viewpoint of gas appliance manufacturers by James F. Donnelly, president, Gas Appliance Manufacturers Association, and vice president-sales, Servel, Inc.

In a convention-departure, spokesmen will discuss the industry's future at a "Coats Off For Action" luncheon, when various phases of the Gas Industry Development Program will be keynoted by three members of AGA's board of directors. Two speakers will present achievements of the gas utilities and the gas appliance manufacturers; the other will discuss PAR and public relations.

The current objectives of the continuing GAMA public relations program will be presented to AGA by Gerry Swinehart, president, Carl Byoir & Associates, Inc. He will bring out facts concerning the rise of prestige of gas appliances and what can be done to help recapture lost markets and broaden the field for gas appliance acceptance. Mr. Swinehart will use colored slide films in his presentation of "The Sleeping Giant Awakes."

W. B. Hewson, vice president, The Brooklyn Union Gas Co. will introduce "Operation Blue Flame," a film which features the TV gas-cooking star, Dione Lucas.

A "Parade of Kitchens" featuring colorful kitchens and kitchen-laundries will be displayed in the Laclede Gas Co. showrooms during the convention period.

Jerome K. Kuykendall, recently designated FPC chairman, will discuss current Commission problems pertaining to the natural gas industry and the relation of these problems to the gas distributing companies.

Jacob Succeeds Borger at Peoples

Edward M. Borger has announced his retirement, owing to reasons of health, as president of The Peoples Natural Gas Co.,

Edward M. Borger

John J. Jacob, Jr.

chairman of the board of directors of New York State Natural Gas Corp., and as a director of Consolidated Natural Gas Co.

John J. Jacob, Jr., who served as vice president and assistant manager of Peoples and New York State Natural from 1942, and as executive vice president of Peoples since January, 1953, will succeed Mr. Borger as Peoples president.

The retiring official has fashioned a distinguished record, in the gas industry and on the Metropolitan Pittsburgh civic front, during his affiliation with the Peoples and New York State Natural firms.

Following his admission to the bar after studying law and business administration at Duquesne University, Mr. Borger was an attorney for Peoples, Hope Natural Gas Co., and other subsidiary firms.

In 1940 he was elected president, director, and manager of both Peoples and New York State Natural, present subsidiary companies of Consolidated Natural Gas Co.

Throughout his career, Mr. Borger has been a participant in other professional and business activities. He is a director of Dravo Corp.; member of the executive committee of the Allegheny Conference on Community Development; and a director of the Pennsylvania Natural Gas Men's Association from 1940 to the present.

Mr. Jacob, who will become Peoples president September 1, began his term of service with the company in 1922, as a civil engineer, and was, in 1936, appointed chief civil engineer.

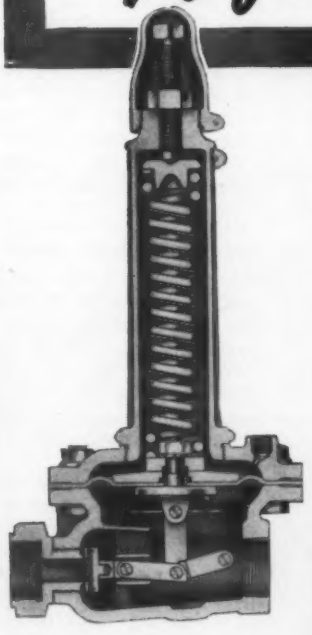
He was elected a member of Peoples board of directors in 1938; executive assistant to the president in 1939; and vice president and assistant manager of Peoples and New York State Natural in 1942. He was elected executive vice president of Peoples in January of this year.

Mr. Jacob was president of the Natural Gas Men's Association of Western Pennsylvania in 1951, and has been associated with American Gas Association activities for a number of years.

IN THE HIGH PRESSURE FIELD

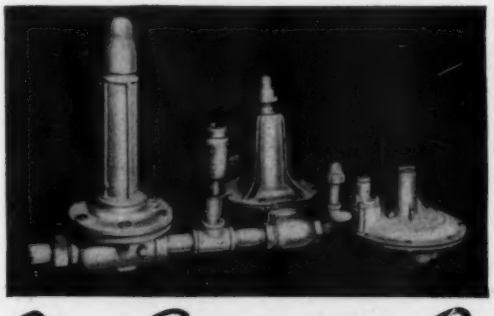
THERE IS SAFETY

IN *Reynolds...*



Accurate, Safe Control

of tremendous pressures is an ever present problem in the gas field. Reynolds field Regulator illustrated at left is one of the many high pressure regulators built by Reynolds. It is thoroughly tested and proved in service. It handles up to 1,000 pounds safely reducing same to pounds. For more than fifty-five years Reynolds has designed and built gas regulators. Safety, accurate performance, years of service—these are some of the built-in factors responsible for Reynolds enviable position in the Gas Control Field.



Reynolds Gas Regulator Co.

ANDERSON, INDIANA, U. S. A.

GAS CONTROL SINCE 1892

Electronic Equipment Simplifies Columbia's Accounting Operations

(Continued from page 19)

the System's standard forms and all of the stationery used in the System are printed and stocked by this department. Its photo-offset operations produce cook books, recipes, pamphlets, advertising literature, employee booklets and other media of the highest printing quality.

The accounting robots, which can do anything from multiplying at the rate of 40 cards per minute to counting 450 cards per minute, have not completely taken over the accounting departments yet.

Continuing property records, considered by some to be the most important of all, are still manually posted. These

Control panel which directs the accounting machine to perform various functions according to the requirements of the report being prepared. A diagram, such as the one shown, is prepared for each operation.

records, kept by the plant accounting departments of each of the Groups, balance at over one-half billion dollars invested in property, plant and equipment. Plant accounting, too, is to be changed over to mechanical methods in the future, but first comes materials and supplies accounting, one of the biggest changeover jobs the System has faced. The changeover, when completed, will effect a substantial labor saving, for when the more than 20,000 different kinds of materials used in the System have been coded and identified, the effect on storerooms, warehousing, accounting and purchasing will mean higher efficiency and lower inventory. Then, property records can be completely mechanized.

Columbia's methods men are always looking for new and better ways of handling the ever-increasing volumes of work of the expanding natural gas industry. The accountants are happy to let the machines take over the jobs.

Gas Sales Gain in June

Sales of the gas utility industry to ultimate customers during June, 1953, totaled 3,788 million therms, a gain of 12.6% over sales in the same month a year ago, American Gas Association reports. The June AGA index of total gas utility sales is 164.4% of the 1947-1949 average.

For the 12 months ended June 30, 1953, utility gas sales totaled 54,800 million therms, an increase of 9.4% over therms sold in the previous cumulative period.

Natural gas utility sales in June totaled 3,561 million therms, an increase of 13.7% over sales in June, 1952. For 12 months ended June 30, sales of natural gas amounted to 51,552 million therms, a gain of 10.5% over sales in the previous 12-month period. The AGA index of natural gas sales for June was 173.9% of the 1947-1949 average.

Manufactured and mixed gas sales in June totaled 227 million therms, a decline of 2.4% under a year earlier. For the 12 months ended June 30, manufactured and mixed gas sales were 3,248 million therms, down 4.9% under the previous comparable period. The June index of manufactured and mixed gas sales was 88.4% of the 1947-1949 base.

AGA Backs Mrs. America Contest

American Gas Association and *Better Living* magazine will cooperate in the 1954 Mrs. America contest, and it has been announced that the ability to cook, shop and run a household in the modern way will count more under the contest rules than beauty. In picking a Mrs. America in 1954 all contestants in the finals will be judged on cooking, meal-planning, laundering, and other household activities.

Rockwell Film Tells Meter Story

Rockwell Manufacturing Co. has issued a moving picture, believed to be the first of its kind, on the design, assembly and operation of a diaphragm-type domestic gas meter. Entitled "Operation 150," the half-hour 16 mm. sound and color film features an animation sequence showing how a typical diaphragm meter accomplishes the measurement of gas.

Starting with a brief series on the role gas plays in the home of today and the reasons for metering, the film moves into a detailed account of meter diaphragm and body casting production. Selected sheepskins are shown being tanned, checked for proper thickness, die-cut into discs, shaped into diaphragm components and being dried, oiled and aged.

Detailed pictures of the manufacture of valve plates, spuds, bearings and other metal parts of the meter are included, in addition to a section showing how the meters may be taken apart and reassembled using only a screw driver and pliers.

Final assembly and testing of the meters are shown in complete detail. The film also includes views of sealing, painting and shipping of the tested meters.

Made by a professional motion picture firm, the film is available on request to Rockwell Manufacturing Co., 400 North Lexington Ave., Pittsburgh 8, Pa., or any of the company's district sales offices.

New Mfr of Brass & Copper Tube

Triangle Conduit & Cable Co., Inc., New Brunswick, N. J., manufacturers of electrical wire, cable and conduit, will manufacture brass and copper tube in its new mill beginning in October. It is the company's policy to sell exclusively through selected distributors who will service plumbing and heating contractors, industrials and all other types of customers.

Operation of the new mill will be under the direction of Henry D. Hohl, vice president in charge of manufacturing. Manager of the mill will be Victor Petersen, who has been in copper tube manufacturing for over 30 years.

Lincoln Elec. Issues Weld Standards

To enable the engineers to acquire cost and quality control over welding operations, The Lincoln Electric Co., Cleveland, O., has created and is making available a set of Weld Standards. The standards are available on tracing paper so that they can be blue-printed or otherwise reproduced for the purpose of giving engineers and production personnel a standard for communicating welding procedure on drawings. The weld standards are based on procedures developed by Lincoln and the weld symbols of the American Welding Society.

The standards, with a simple letter designation, specify according to plate thickness both the type and size of weld and how it should be made. For a specified plate thickness weld standards give the electrode type and size, the polarity and current, electrode melt-off rate, arc speed, number of passes or beads, feet of joint welded per hour, and the pounds of electrode required per foot of weld. Standards have been prepared for manual welding of butt welds, fillet welds, lap and corner welds in all positions.

Complete sets of 19 sheets on tracing paper in a loose-leaf binder are available from The Lincoln Electric Co., Cleveland 17, O., for $1.00 per set, postage prepaid in U.S.A.; $1.50 elsewhere.

Haartz-Mason Forms New Division

Haartz-Mason, Inc., Watertown, Mass., manufacturers of coated fabrics, announces the formation of a mechanical products division, which will manufacture molded diaphragms and rubber coated fabrics for industrial applications. Primary product development will be for the automotive, aviation, gas and petroleum industries. T. H. McConnell, Jr., former supervisor of sales for Vulcan Rubber Products, Inc., is general manager of the new division.

New API Gas Training Course Set

A new vocational training course covering field handling of natural gas is now being made available by the division of Production, American Petroleum Institute. The course was developed by the University of Texas, under a grant-in-aid from the Institute. Although it is primarily intended to train company employes in the gathering, treatment and control of natural gas on a producing lease, the course also has application to some phases of natural gasoline plant operations.

Instructors are full-time professionals employed and specially trained by the state departments of vocational training.

MEN AT WORK

Zwanzig Directs AGA PAR Program

Otto E. Zwanzig, formerly director of the Bureau of Statistics, has been appointed director of the PAR Program of

Otto E. Zwanzig

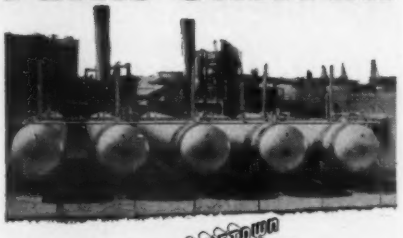
Daniel Parson

American Gas Association effective August 1. Also, it was announced that Daniel Parson has been advanced from senior statistician to director of the Bureau of Statistics, succeeding Mr. Zwanzig.

Previously, the PAR activities were directed on a part-time basis by John W. West, Jr., assistant managing director of AGA. Mr. West now assumes responsibility under the managing director for all headquarters activities other than the PAR Plan and those of the corporate secretary.

Mr. Zwanzig, who also becomes secretary of the PAR committee, will be responsible for the administration of promotion, advertising and research activities financed by PAR funds.

PEAK SHAVER



BY DRAKETOWN

This packaged propane plant designed, engineered and built by Draketown, provides a completely interchangeable fuel for natural gas.

Draketown can design and build one for you, *within your budget*, to take over all or part of your load at the turn of a valve.

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AUGMENTATION
100% TOWN OR PLANT SUPPLY

Serving utility and industry for over thirty years

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Mr. Parson joined AGA in 1944, and was appointed senior statistician in 1948. He has directed tabulation and presentation of material in "Gas Facts," AGA house-heating surveys and other statistical bulletins.

Glover is Arkansas Western Mgr.

Reid Glover has been made district manager for Arkansas Western Gas Company's River Valley district properties, L. L. Baxter, president of Arkansas Western, announced recently. Mr. Glover will be in charge of the company's new business activities and will have charge of transmission and distribution operations in the district.

Mr. Glover has been associated with the natural gas industry for the past 20 years. His initial employment was with River Valley Gas Co. in 1932 where he was employed in Ozark, Ark., as a serviceman and salesman. The River Valley Co. was purchased by Arkansas Western in 1940 at which time he was made manager of the Ozark division.

Curtis Morris to Join AGA Exec Staff

Curtis Morris, vice president of Transcontinental Gas Pipe Line Corp., will join the executive staff of American Gas Association on October 1. Mr. Morris, who joined Transcontinental in 1949, handled legislative, tax, and public relations matters for the company.

In his new post he will initially study AGA's facilities and services devoted to natural gas production and transmission. He is expected to make recommendations for the Association's greater usefulness to producing, transmission and distributing gas companies.

Columbia Gas System Promotes 2

Albert V. Schwartz has been elected assistant treasurer of Columbia Gas System Service Corp. and Robert J. Farley has been appointed new supervisor of the methods department, Columbus office.

Mr. Schwartz, who joined Columbia in 1933, came to Columbus in 1946 as supervisor of the methods department. He was advanced to assistant controller in 1951.

Grazier Acting Pres of Amer Rad

At a special meeting of the board of directors of American Radiator & Standard Sanitary Corp. recently, Joseph A. Grazier was elected acting president to serve as its chief executive officer. The action was taken because of the continued illness of Theodore E. Mueller, president of the corporation. Mr. Grazier is now executive vice president and a member of the board of directors and its executive committee.

Gerson Skinner Joins AGA Staff

Gerson L. Skinner has joined American Gas Association headquarters staff as a member of AGA's field representative project. Mr. Skinner was previously employed by Bohn Aluminum and Brass Corp., Adrian, Mich.

Genl Amer Trans Corp Names Mgr

Richard H. Lamberton has been appointed midwest manager, Plate and Welding div., General American Transportation Corp. With headquarters in Chicago, he will be in charge of midwest sales of the division.

A Complete
MAIN TREATMENT SERVICE

Prepare for Natural Gas

GPM PRODUCTS

"FLUSHALL"
– Dust Removal
"SOLVALL"
– Liquid Phase Gum
"SEALALL"
– Joint Sealing
"WETALL"
– Dust Laying
"FOGALL H"
– Hot Fogging
"FOGALL C"
– Cold Fogging
"RUBBER CONDITIONER"
– Rejuvenating
Rubber Gaskets
"IRON HYDROXIDE"
– Purification

Discuss your problems with our engineers

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STAINLESS STEEL BAND

Pipe Repair Clamp

With Stauffer Special No. 220 *exclusive* slotted lug, pinhole leaks can be repaired in 60 seconds. The most effective, easiest to install clamp with non-corrosive band on the market today YET priced to save you money.

Outstanding features

★Patented open slot lug enables user to drop bolt through slot and tighten.

★Gasket *cemented* to band.

★Provides positive, permanent repair. Made of non-corrosive material, 18-8 stainless steel lasts a lifetime.

★Flexible band conforms to pipe irregularities without crushing weak pipe.

★EXCLUSIVE ADAMS FEATURE...Castings have two coats of powdered stainless steel in plastic suspension.

Specifications

BAND—Type 18-8 Stainless Steel
LUG—Malleable Iron
BOLT—Zinc Plated Steel with Heavy Hex Nut
GASKET—Soft Neoprene Rubber

Adams

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WRITE FOR FREE LITERATURE

Orchard is United Gas Corp GSM

E. B. Orchard has been promoted to general sales manager of Texas distribution operations, United Gas Corp. and will be in charge of sales in the four divisions serving the South, Southeast and East Texas. Mr. Orchard joined the organization in 1934, and has held positions in the sales, purchasing and engineering departments.

Stehman Retires from Bklyn Bor Gas

Frederick Stehman, vice president of Brooklyn Borough Gas Co., retired from active duty in August, after nearly 40 years' service with the company.

Mr. Stehman joined the company's staff in 1913 as an engineer. He will continue as a member of the board of directors of Brooklyn Borough Gas Co.

R. E. Hoierman is Dravo Div Ad Mgr

Richard E. Hoierman has been named advertising manager for the Machinery division of Dravo Corp. and the Dravo-Doyle Co., a subsidiary, succeeding Robert C. Black who has been transferred to the sales staff of the Heating department.

Since 1950, Mr. Hoierman has been assistant to the director of advertising of Cooper-Bessemer Corp.

Southern Heater Names 2 VPs

The board of directors of Southern Heater Co., Inc., recently elected H. N. Stall vice-president in charge of engineering, and A. J. Saucier, Jr., vice-president in charge of Memphis branch operations.

New SM for Titan Valve Co.

Donald J. Wood has been appointed sales manager of Titan Valve & Manufacturing Co., it has been announced. Prior to this appointment he was sales manager of Duval Engine Co.

JOHN ALCORN has been promoted to assistant to the president of export companies, foreign sales office, *Cooper-Bessemer Corp.*

CHESTER S. BEARD is now research and development engineer, *Foster Engineering Co.*

WILLIAM S. BEATTY has been appointed department head, general accounting, *New York State Natural Gas Corp.*

JAMES G. BERGMAN, JR., is now department head, general financial, *New York State Natural Gas Corp.*

ARTHUR R. BLOTTER has been elected assistant treasurer, *New York State Natural Gas Corp.*

W. BAXTER BOYD has been named vice president, charge of geological, exploration and land departments, *Republic Natural Gas Co.*

JOHN T. BROWN has been elected vice president and general counsel, *Equitable Gas Co.*

ALLEN S. CARPENTER has been appointed manager, Nebraska branch office *General Controls Co.*

JOHN S. MCELWAIN has been appointed personnel director, *New York State Natural Gas Corp.*

ROY B. MUNROE was appointed manager, domestic sales, *Peoples Gas Light and Coke Co.*

RICHARD P. MURLLESS is now sales engineer, Arizona, Meter and Valve div., *Rockwell Mfg. Co.*

EVERETT B. ROUDEBUSH has been named manager of land and leasing, *Northern Natural Gas Producing Co.*

ALBERT V. SCHWARTZ was elected assistant treasurer, *Columbia Gas System Service Corp.*

ROBERT E. SPANGLER has been named sales director, south section, *Peoples Gas Light and Coke Co.*

BERNARD H. WITTMANN is now assistant to vice president, charge of sales, *Peoples Gas Light and Coke Co.*

Bryant Indust Prod Corp Set Up

Formation of the Bryant Industrial Products Corp. and its purchase of the principal assets and production facilities of the Bryant Industrial division, Affiliated Gas Equipment, Inc., was announced recently by Robert M. Buck, president of the new Cleveland enterprise.

The new firm, to specialize in the design, production and marketing of industrial gas combustion equipment, will be located at 17700 Miles Ave., Cleveland.

"Plans for the immediate future include the expansion of present product lines and the development and introduction of several new lines, as well as broadened engineering and sales activities," Mr. Buck said.

Officers of the new company, in addition to Mr. Buck, are Lawrence R. Foote, vice-president, and John Sellors, Jr., secretary-treasurer.

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NEW BOOKS

PIPEFITTERS HANDBOOK. By Forrest R. Lindsey.

This pocket-sized book has been designed to provide the answers to problems involving pipe bending, layout and installation. While it is described by the publishers as being especially useful to pipefitters, it appears to have an equally high usefulness to design engineers as they plan piping layouts.

The book includes complete data on piping problems. It covers the various types of pipe and fittings and methods of connection.

There is substantial general-reference information, such as sheet steel gages, melting points, general mathematical tables and an excellent section on the calculations of areas and volumes.

This handbook is an excellent example of a book that has been prepared to meet fully the requirements of the job for which it is intended. First, it is in a size that makes it convenient either on the job or on the drawing board. Then, the type matter has been arranged for easy reference and, through adequate type sizes, avoids the danger of misreading. The cross-section drawings are simply and clearly prepared.

Pp. 232. The Industrial Press, 148 Lafayette St., New York 13. $6.00.

HEATING, VENTILATING AND AIR CONDITIONING GUIDE, 1953.

The 31st edition of this well-established reference book, published annually by The American Society of Heating and Ventilating Engineers, includes a number of new features of interest to gas utility engineers. New information on industrial gas burners, chimneys and data for design calculations are included together with appropriate revisions of data from earlier editions.

The technical data sections total 1,096 pages. A separate psychrometric chart, 24" x 32", is printed in two colors to facilitate solution of problems involving air.

Pp. 1,560 + xxiv. The American Society of Heating and Ventilating Engineers, 62 Worth Street, New York 13. $7.50.

CODE FOR PROTECTION AGAINST LIGHTNING.

This current revision is sponsored jointly by National Bureau of Standards, National Fire Protection Association and American Institute of Electrical Engineers. It has been approved by each organization as sponsor and by American Standards Association.

The volume recognizes aluminum as a suitable material for lightning protective systems, and as a result of experience obtained, additional bonding requirements have been added for steel tanks containing flammable liquids and gases.

Sections of the code are devoted to: protection of persons, protection of buildings and miscellaneous property. Also, a section on protection of structures containing flammable liquids and gases includes chapters on: mandatory and advisory requirements; protective measures; and protection of specific classes of structures.

Pp. 88 + x. Superintendent of Documents, Washington 25, D. C. Price, $0.40.

AUTOMATIC CONTROL OF HEATING AND AIR CONDITIONING. By John E. Haines, vice president, Minneapolis-Honeywell Regulator Co.

This new book on controls takes the reader successively from the fundamentals, through the theory and then the basic types of control methods. The author clarifies the fundamentals of measurement, for application to control, and then details the types of circuits and units which are involved in control of heating and air conditioning equipment.

Every aspect of control in domestic and commercial installations is handled with adequate circuitry to enable the reader to understand clearly the designs of control systems.

The illustrations are clearly understandable and should prove to be very useful. They include equipment drawings which show parts details for reference in either understanding operation or trouble shooting.

Separate chapters emphasize the need for special considerations of the control of commercial refrigeration and radiant-panel heating systems.

Pp. 370—vii. McGraw-Hill Book Company, Inc., New York 36. $6.75.

HANDBOOK OF CAST IRON PIPE.

This is the second edition of this handbook which is primarily intended for design engineers utilizing cast iron pipe and fittings. Of particular interest to engineers in distributing gas utilities are the new data reflecting changes that have occurred in the cast iron pipe industry since the first edition was published in 1927.

New specifications for pipe are included together with increased knowledge of stresses in underground piping; also, new coefficients of flow in pipe, together with improvements in pipe laying practices.

The 19 sections of this book arrange information according to the general categories in which solutions to problems will be sought. The illustrations, principally cross-sections and other dimensional problems are clearly presented together with other related diagrams.

Pp. 444. Cast Iron Pipe Research Association, Chicago 3. $5.00.

HAUCK INDUSTRIAL COMBUSTION DATA.

This third edition of a handbook presents practical information for determining the selection, installation and methods of operating industrial combustion equipment, principally the equipment of the manufacturer-publisher. However, the book includes, in addition, such a wealth of generally applicable information that its use by engineers concerned with industrial heating should be substantial.

Theoretical discussion of combustion engineering has been omitted from the book and, as the preface states, left "to its more logical place in a number of excellent text books already available." The technical data are presented in a concise and practical form.

While the book views both gas and oil burning equipment and the related data, the usefulness to the gas industry of this handbook should be high.

The charts and tables are presented with fine clarity; equally impressive are the drawings of system layouts for industrial gas.

Pp. 168. Hauck Manufacturing Co., 124 Tenth St., Brooklyn 15, N. Y. On appropriate application.

TRANE AIR CONDITIONING MANUAL.

In the second major revision since 1938, also the 16th printing, this manual incorporates a number of changes which encompass late developments in the field.

The volume organizes, in a manner that facilitates both direct reading and specific reference, the entire field of air conditioning. Eight chapters present full discussions of considerations in the design of systems for all classifications of structures that are subject to air conditioning.

The general headings for the chapters are subdivided to achieve full organization of the material: heat; comfort; heat gains; properties of air and the psychrometric chart; calculations for the conditioned air supply; refrigeration for air conditioning; water for air conditioning; ducts and fans.

Important to this volume are the illustrations which include charts and diagrams. Also, there are tables appropriate to the text, conveniently arranged. The book has a separate section of general reference tables which will have broad applicability.

A feature of this book is the series of problems which are placed at the ends of the chapters and which deal with the subject of the respective chapters. While this may appear to be an academic approach, the authors have rendered a service here by making it possible for the reader to test his own understanding of the discussions. The answers to the problems, for self evaluation of the examinations, are given at the back of the book.

This book has been prepared for continuing reference use. The manufacture of the book is excellent in every respect.

Pp. 380 + xx. The Trane Company, La-Crosse, Wisc., $5.00.

FIRE PREVENTION AND PROTECTION FUNDAMENTALS. By Gilbert E. Stecher.

The author, a fire protection engineer, states that his purpose in preparing this volume is to present to those who are charged with responsibilities for fire prevention and protection, the basic principles by which fire hazards may be analyzed and then to provide a comprehensive source of information for dealing with the overall fire problem.

Twenty-one chapters in this book are fully subdivided under their general titles and the scope of the entire work can best be visualized by the chapter titles: chemistry and physics of combustion; electrical methods of temperature measurements; phenomena producing fire; flammable liquids; flammable gases; flammable dusts; hazardous chemicals; building construction; exposure; occupancy; possible causes of fire: water supplies; public fire departments; private fire brigade; special extinguishing systems; first aid equipment; automatic sprinkler systems; alarm systems.

The author appears to have been exhaustive in his search for data that would be useful in considering fire problems. The charts and tables are clearly presented together

with appropriate illustrations of equipment, methods and charts.

Approximately 100 references to related works are given for those who wish to pursue specific subjects at greater length. The author has provided a very full index using a topical arrangement.

Pp. 744 + xii. The spectator, Chestnut and 56th Streets, Philadelphia 39. $10.00.

ECONOMICS OF NATURAL GAS IN TEXAS. By John R. Stockton, director, Bureau of Business Research, The University of Texas; Richard C. Henshaw, Jr., statistician, Bureau of Business Research, The University of Texas; Richard W. Graves, instructor, the Tulane University of Louisiana.

The general field of interest for this book is among economists and statisticians who are concerned with the economic details of natural gas. However, it includes useful reference information for executive perusal.

Limited by title to the State of Texas, the authors have assembled an exhaustive study of natural gas and have included their own discussions together with supporting statistics. They cover the utilization of gas and natural gas liquids. Then they proceed with considerations of production, reserves, transportation, Texas taxation, regulation, conservation and the position of gas in competition among fuels. Eighty-seven tables, 38 charts and 19 non-statistical illustrations support the authors' discussions.

Each of the ten chapters is supplemented fully with appropriate bibliographies.

Pp. 316 + xvi. Bureau of Business Research, The University of Texas, Austin, Tex. $5.00.

Laclede Applies McIlroy Network Analyzer

(Continued from page 15)

In setting up the analyzer, no attempt was made to represent the branch piping between the mains and the regulators. Consequently, the chart record could not be expected to agree exactly with the analyzer results particularly at heavily loaded regulators. Also, because no record is kept of gauge calibration the chart readings were accepted at face value. These factors must be considered when comparing the analyzer readings with the chart records. The accuracy of the assumptions which must be made in order to allocate the load to the system must also be considered. It is our conclusion that the analyzer's accuracy in reproducing the system conditions lies well within practical limits.

The map in Figure 1 shows pressures at some of the major intersections and tag ends as obtained from the analyzer as well as available adjacent gauge readings. The scale of the map has been distorted to some extent in order to represent the problem on the map panel of the analyzer.

The time spent preparing the data to set up the analyzer for this first problem was approximately equal to the time spent in preparing work sheets and plats for manual calculation of the problem. Setting up and adjusting the analyzer, taking readings and recording the results took almost a day for two men. One of these men had previously assisted in setting up a small test problem at the standard factory in Springfield, Mass.; the other man had no previous knowledge of the analyzer. The second problem, which was similar in magnitude, was set up and analyzed by the same two men in a half-day.

Manual calculation of the system shown in Figure 1 usually requires between seven and ten days of one man's time to attain a satisfactory pressure balance. This may seem excessive at first glance, but it must be remembered that the first step consists of assuming input flows at the sources. The flows in each leg of the entire network must then be determined and the pressure drops calculated. Rarely will the first assumption of inputs be correct for all sources. It is then necessary to revise the inputs and re-calculate the entire network. It is during this part of the work that the small sacrifices to accuracy are made. Short cuts such as assuming that the district regulator take-off is located at the street intersection when actually it may be a short distance around the corner are made to reduce the number of pipe lines to be calculated. This sort of thing is unnecessary with the analyzer since it will automatically adjust for all system conditions imposed upon it.

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One Man Operation

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Iron Sponge is your key to sulfur-free gas at minimum processing cost. Iron Sponge has high efficiency at low pressures or at today's high pressures and high temperatures. It absorbs *more* H_2S, gives long service between foulings, and is easily regenerated. Investigate it for your purification problem today!

CONNELLY, Inc.

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Elizabeth, N. J. • Los Angeles, California

LP Plants Have Future Use in Utility Systems

(Continued from page 17)

This could be brought back to 1,000 by cold enriching with propane vapor.

Another use of propane that is again seeking favor with the gas utilities is its use in the new housing developments. With population moving into rural areas, where there are no gas mains, the problem of serving them becomes serious in two ways: (a) The cost of extensions, and (b) Will all the proposed houses be built? We have had cases where 100 houses were to be constructed and only 10 or 12 went up. There are cases where a small number of houses were to be built and developments of from 300 to 500 resulted.

In instances such as these, the distribution system is laid out as though city gas were to be used and propane tanks installed to take care of the load until an extension can be justified.

This same condition also holds true with industrial concerns. Many companies are moving out of heavily populated areas. Here again, a small propane plant can serve them until the line can be justified.

Also, with the advent of natural gas, many industrial concerns possessing propane plants desire the more economic natural gas. Some consideration should be given to the use of the propane plant for winter gas or gas curtailment. For example: 2 or 3 large industrial plants that could not be reached have installed propane plants. With the coming of natural gas these plants are easily accessible. They can be sold off-peak summer gas for 8 or 9 months and the propane plants operated for the other 3 or 4 months, thus creating a better balance in load factor.

Tex. Trans. Corp Completes Line

Texas Gas Transmission Corp. has put into service the final 45-mile segment of its 1952-1953 construction program.

The system, serving utility and industrial customers in Kentucky, Tennessee, Indiana, Illinois, Mississippi, Arkansas and Louisiana, can now deliver more than 1 billion cubic feet of gas a day through 3,236 miles of pipeline.

During 1952 the company built 363 miles of 26-inch line, but delays in pipe deliveries prevented construction of the final 45 miles before winter weather.

Rockwell Names Training Supervisor

Richard F. Dean has been appointed supervisor of employee relations and training program, Rockwell Manufacturing Co.

Mr. Dean, former assistant to the training director in the central staff, industrial relations department, Koppers Co., Inc., will work on the staff of E. F. Foubert, manager of industrial relations.

Variety of Gas Utility Questions Answered by Court Decisions

(Continued from page 21)

not award compensation.

In Lee v. Memphis Natural Gas Company, 197 So. 639, it was shown that an employee of a gas company was injured and he filed a suit to recover compensation under the State Workmen's Compensation Act. The employee alleged that he slipped and fell seriously injuring his back and spine while doing his regular work for the gas company.

However, the employee failed to prove by fellow workmen, or others, that he had received the injury while attending to his regular work. Therefore, the court refused to allow the employee any compensation.

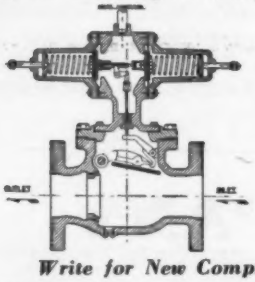
This court explained that without such proof the courts throughout the United States would consistently award compensation to employees injured outside the scope of the employment.

General Controls Co Adds 5 Acres

General Controls Co., now building a new plant for its Appliance Controls division in Burbank, Calif., has just concluded a lease arrangement for 5.2 acres of additional land to be used for parking area and future plant expansion. It gives the company a total of 21 acres and more than 2,000 feet of continuous frontage.

THERE IS A *Security* AUTOMATIC SHUT-OFF VALVE FOR EVERY REQUIREMENT

Security Valves will provide automatic shut-off in the event of either increase or decrease in pressure. Installation may be upstream or downstream (in relation to the regulator), with or without static line control, for either high or low pressure application.



MODEL "IDPS-H" (closes on Increase OR Decrease in Pressure; Static line control, High pressure application). Described in detail in Bulletin 227-C.

Write for New Comprehensive Bulletin

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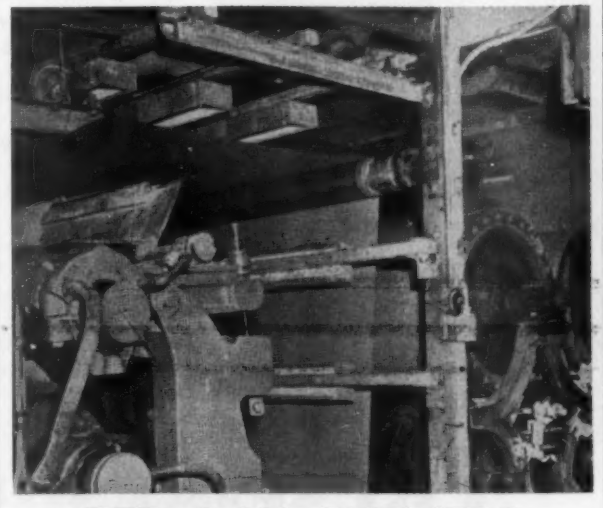
LOS ANGELES 53, CALIFORNIA



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Tel: Plaza 7-5174

Steady Bond Market Anticipated

(Continued from page 27)

their annual dividend requirements, either total payments for last year—including year-end extras—or the higher payments being made in 1953. Most others have earned a major portion of such payments.

Paced by higher distributions announced by a number of public utility companies, chiefly electric utilities, the dividend news continues to improve. Payments to shareholders gained by 5½% in July this year and brought disbursements for the seven months to $4,589 million, or 4½% more than in the similar 1952 period.

Common stock yields currently are fairly close to the best level of 1953, due chiefly to the favorable trend of dividend payments. The yield obtainable from the 200 issues comprising the common stock index of Moody's Investors' Service stood at 5.46% at latest report, compared with 5.51% a month earlier.

While the yield from the Moody's stock index has been pared slightly, the rate of return available from the same organization's bond index slipped off 13 basis points in the same interval, with the result that the common stock yield now is 56% higher than the bond index yield, as against 52% a month ago.

A significant development in the stock market has been the contraction in trading activity in the face of a sharp increase in the number of listed issues and in the number of shares contained within. Latest data show turnover in the share market to have dropped to 13% compared with an annual rate of 24% registered in 1945. This occurred despite an increase of 92% in the number of listed shares—to 2,877 million on June 30, 1953, from 1,492 million in 1945—and despite an increase of 21% in the number of issues, to 1,525 from 1,259, in the same period.

This dwindling of trading in the face of sharply increased share volumes has been variously described in stock market quarters as due to lack of speculative interest due to uncertain corporate earning prospects for 1954 and to a shortage of venture or risk capital which could be remedied by a change in the tax laws favorable to speculative buying.

Singing of the blues by the brokerage houses is easily understood, and there is something to be said in favor of their skepticism. But they also must be cognizant of the fact, and it is a fact, that institutions and other investors have been taking large blocks of stocks off the market for long-term holding as investments. This is a development which seems certain to continue so long as individuals funnel the bulk of their savings into institutions for safekeeping rather than commit them directly to stock market investment.

Corporate expenditures for new plants and equipment probably will taper off moderately in 1954 and buying for inventory should slacken. Defense or war spending is definitely on the wane, and lack of the former stimulus to the economy from this source suggests a cautious policy by business and consumers alike.

But while retained profits of corporations might decline somewhat over the year ahead, in reflection of somewhat lower earnings and a higher payout of dividends to available earnings, the continuing increase in depreciation accruals is expected to preclude more than slight change in the total of funds generated internally through operations and available for plant additions and improvements.

Looking ahead through early 1954 the road signals indicate that dividend payments can be maintained easily at the high level of 1953 because of prevailing profits, the expending amount being provided from depreciation accruals and the likelihood of expenditures for inventory purchases and for acquisition or improvements to plant and equipment.

The earnings and dividend experience of the individual companies will vary with the fortunes of their specific industries. But for the utility—both electric and gas, and combination companies—the accent should be on the favorable side for the great body of companies, thanks to continuing growth, good management husbandry and, in some instances, to rate relief granted by state commissions and by the Federal Power Commission, which is recognizing the gas companies' need for more liberal treatment if they are to attract the large amount of capital they need to carry on their expansion.

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FIFTY YEARS OF SOUND
STEEL PLATE CONSTRUCTION
GAS HOLDERS **PURIFIERS**
Gas Holder Repairs **Gas Holder Inspection**

NEW EQUIPMENT

Lubricant tubes

Two newly-designed lubricant tubes, a flat-top gun lubricant and a long-spouted bulk lubricant tube, have been introduced.

With the flat-top tube, it is said a lube-gun can be loaded in seconds by cutting off the tube top and turning a key which squeezes the contents directly into the barrel. With the long-spouted tube it is reported the spout gets the lube further down into the valve shank than is possible with previous methods. The gun lubricant tubes are available in packages of six; the bulk tubes singly and in packages of four. Eight types of lubricants are available in the new tubes.

Flat-top & Long-spouted Tubes. Rockwell Mfg. Co., 400 No. Lexington Ave., Pittsburgh 8, Pa.

Crane carriers

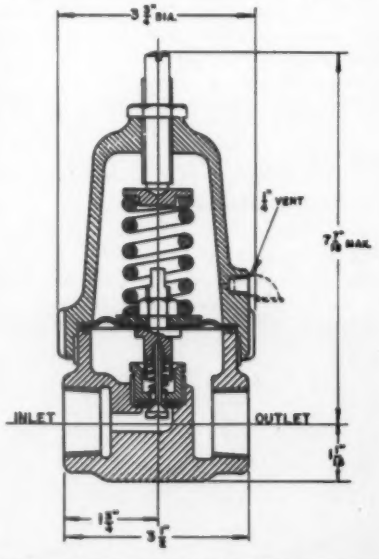
These crane carriers are available in all capacities from five-ton and for all makes of cranes, shovels, drag lines and trench

hoes. Special features of the line announced by the manufacturer include the new arrangements of the: operator's cab; engine hood; engine; instrument panel; battery box; rigging and tackle box; bumper; frame and fenders. Hinged at the front, the operator's cab allows free access to left side of engine. Safety rods and supports hold the raised cab and engine in position. These carriers are available with gasoline or diesel engines, while choice of makes and types are offered.

Cook Crane Carriers Cook Bros. Equipment Co., 1815 North Broadway, Los Angeles 31, Cal.

Farm tap regulator

A farm tap regulator for high pressure services, designed to reduce pressure on high pressure transmission lines to a point



where pressures reaching isolated customers can be handled by a conventional service regulator, has been announced. The unit operates with inlet pressures ranging up to a maximum of 1,000 psi. Interchangeable springs provide four outlet pressures; 5-30 psi, 30-75 psi, 75-300 psi, and 200-400 psi. A special groove in the diaphragm sealing surface in the body casting is said to retard diaphragm pull at high outlet pressures, and to afford positive sealing. The new cover has a ¼" tapped vent, with a special vent cap available.

Model 118 Farm Tap Regulator. Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.

Trencher

A new 4-speed motor transmission has been developed for the company's baby digger model trencher. The new unit, doubling the number of digging wheel and traction speeds previously available in the model, is said to be easy shifting and to provide for a more evenly graduated progression of usable speed combinations. For each of the new wheel speeds (4 forward, 1 reverse) there are 12 crawler speeds. The 48 speed combinations are said to provide digging speeds ranging from .45 to 34.6 fpm. The transmission is completely contained in a welded steel oil tight housing. Equipped with anti-friction bearings, its alloy steel gears are machine cut, case-hardened and heat treated.

Model 92 Baby Digger. Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17.

Radiator for stock tank heater

A new radiator, with a continuous, gradual, elevated rise throughout the heat travel that reportedly assures constant burner operation, has been designed for the manufacturer's gas burning model stock tank heater. The new design is said to eliminate all dead air pockets, the continuous air flow also providing draft stoppage that sometimes interrupts burning. The new radiator is standard equipment on all of the company's gas burning units; fully automatic, semi-automatic and manually controlled models.

Siebring Gas Burning Units. Siebring Mfg. Co., George, Ia.

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NORWALK POSITIVE PRESSURE CUT OFF VALVES

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- No pressure loss!
- All parts external to gas flow!
- Quickly reset after operation!
- Sizes from 2" to 16"

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NORWALK VALVE COMPANY
South Norwalk, Connecticut

Remote base volume indicator

A new remote telecounter makes possible the reading of base volume index indications at control points far removed

from meter installations. Measurements registered on the index are transmitted electrically from the meter site to a remote counter at the reading point. The base volume index is said to automatically correct the gas measured by the meter to base temperature and base pressure conditions. The transmitting device, mounted on the side of the base volume index in an explosion-proof housing, is actuated by the same motion that drives the mechanical counter. The remote counter is 1⅝" x 4" and registers up to 999,999 in either hundreds or thousands of cubic feet as determined by the capacity of the meter required. A reset knob on the side permits resetting of the register numerals to zero whenever desired. DC for the telecounter circuits, from commercial power lines, is provided by a "power-pack" having provision for setting operating current and voltage to proper values for the type and length of transmission line. Telecounter equipped base volume indexes may be installed on large capacity ironcase meters. Units are equipped with a regular index for reading base temperature and pressure corrected gas quantities at the meter, and a supplementary index for obtaining readings of actual gas quantities at line pressure and temperature.

Base Volume Index Telecounters. American Meter Co., Erie, Pa.

Spray painting outfit

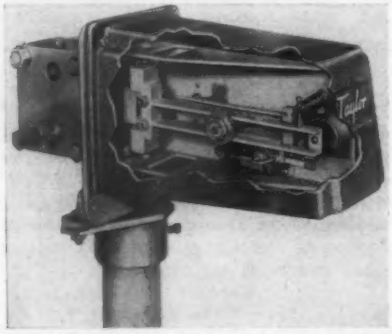
A spray painting outfit that is entirely self-contained on a four-wheel trailer for truck-towing is now available for general

use, after original development for the Navy. The compressor has a capacity of 35 cfm and can handle as many as three separate guns simultaneously. The compressor is driven by an 8 hp air-cooled motor that is complete with self-starter, battery and generator. Two 10-gallon paint tanks are standard equipment, but two 20- or 30-gallon tanks can be installed without structural change. Paint may be drawn from either or both tanks at one time. Air and fluid are carried through 100 foot hoses wound on reels. Other features of this equipment include automatic compressor unloader, air-motor-driven paint agitators, compressed air dryer and built-in hose line cleaner.

Model N4-432 Paint Spray Trailer. Universal Manufacturing & Sales Co., 5211 Pacific Blvd., Huntington Park, Cal.

Differential pressure transmitter

For flow, liquid level and specific gravity applications, this differential pressure transmitter is a force-balance instrument de-

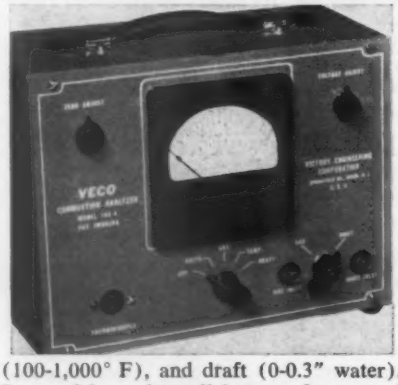


signed to convert differential pressure into an equivalent 3 to 15 psi output. It can be used to measure flow of liquid, steam or gas; liquid level or specific gravity. It is available in two ranges; 20"-to-200" water, and 80"-to-800" water. The transmitter has two basic units; the primary, which senses differential pressure, and the secondary, which transmits the proportional output air pressure. A built-in damping device, the manufacturer reports, provides true average damping with pneumatic stability.

Transaire Transmitter. Taylor Instrument Companies, Rochester 1, N. Y.

Combustion analyzer

This commercial, portable, all-electric complete combustion analyzer is said to measure % CO_2 (0.20%), temperature



(100-1,000° F), and draft (0-0.3" water). Powered by a dry cell battery, features of the analyzer include: glass coated electronic thermistor; gas analysis cell with built-in temperature compensator, filter-drier, compensated thermocouple lead, and two 30" probes. Flue gas temperatures are taken at the same point as the CO_2 measurement, and a series of readings may be taken without moving probes.

Model 140-C. Victory Engineering Corp., Springfield Rd., Union, N. J.

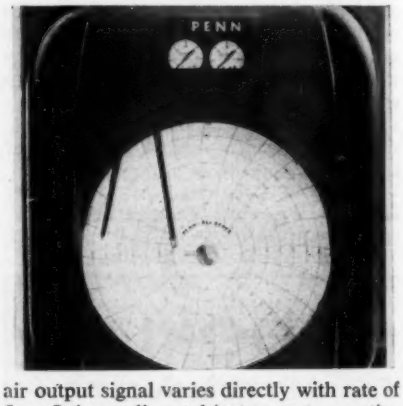
Cut off valve

This positive pressure cut off valve was designed primarily to prevent runaway pressures in low pressure systems, and is said to be flexible in utilization. It can be used in large industrial or commercial installations to prevent excessive buildup of pressure in case of failure of the service regulator or other cause. A feature of the valve is the addition of a fusible link to the controlling lever arm which reportedly will cause the valve to operate in case of fire by stopping the flow of gas throughout lines with areas endangered. The valve is available in sizes 2" to 16" and can be adjusted to cut off at any desired pressure, and is easily reset after operation. The company reports there is practically no pressure loss throughout the line, and the valve does not require large vents.

Norwalk Positive Pressure Cut Off Valve. Norwalk Valve Co., Norwalk, Conn.

Flow meter

A variable area type flow meter, now furnished with pneumatic transmission, the instrument is fundamentally linear and the



air output signal varies directly with rate of flow. It is an all metal instrument operating on the rotameter principle. It is mounted directly in the pipe and is suitable for measuring rates of flow of liquids, vapors or gases from 0.3 to 3 gpm minimum flow range to 120 to 1200 gpm maximum. Available in sizes from 2" to 8" with a choice of materials for meter bodies and internal metering components, the instrument has a metering float which rides vertically up and down in a tapered metal metering throat inside the meter body.

Penn Linameter. Penn Industrial Instrument Corp., Penn Bldg., 4110 Haverford Ave., Philadelphia 4, Pa.

Portable air compressor

This new 75 cfm portable air compressor, for standby service and emergency pipeline repairs or direct production jobs, is a medium size compressor that can be handled by one man. The unit weighs 1,280 lbs., can be towed at high speed behind a passenger car, and uses a 6-cylinder Chrysler engine which has been rebuilt for compressor service. Power from three cylinders of the engine are used for air compression and the other three for power. Mounted on a three-wheel trailer, with retractable pivot wheel, large tool boxes are on each side of the trailer.

Model Hornet 75. O.K. Clutch & Machinery Co., Florence St., Columbia, Pa.

NEW BULLETINS

SECURITY AUTOMATIC SHUT-OFF VALVE. This bulletin describes one model of the manufacturer's 8 new basic models of automatic shut-off valves. It is a self-contained unit designed to provide automatic shut-off in the event of increase of pressure to a specified predetermined high above normal line pressure. The bulletin presents a typical installation, a table of weights and dimensions, information on function, construction and application. In addition, there is a brief description of each of the other 7 basic models.

Bulletin 132-D4. Pp. 4. Security Valve Corp., P.O. Box 1551, Los Angeles 53.

THE CLEVELAND TRENCHER MODEL 110. This bulletin, in two colors, features the wide versatility of the company's trencher. Many job applications within the trench size range of the model are illustrated. Design and construction features are presented, in addition to a numbered outline photograph showing position of important parts. The bulletin contains information on the manufacturer's optional extra equipment for special trenching requirements and a table of 48 digging wheel and crawler speed combinations. Photographs from all types of trenching jobs are included to show the all-around useability of the model. Complete dimensions and specifications are given, with a table of optional bucket sizes showing both standard and maximum cutting widths.

Bulletin No. S-116. Pp. 8. The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17.

PYRO OPTICAL PYROMETER. This illustrated bulletin contains information on the Pyro optical pyrometer which measures high temperatures by comparing and balancing the brightness of the hot body with that of a calibrated electric lamp. The method is said to be used successfully for measuring temperatures from about 1,400° F to the highest known temperatures attainable in industrial and scientific work. The instrument is said to require only a very small surface on which to sight, and to enable rapid temperature determinations of minute spots, fast moving objects or the smallest streams at comparatively long distances and point by point. The bulletin offers features of the instrument, method of operation, maintenance and accessories.

Bulletin No. 80. Pp. 6. The Pyrometer Instrument Co., Bergenfield 8, N. J.

BRISTOL CONTROL INSTRUMENTS FOR FURNACES, OVENS, DRYERS, AND KILNS. Control instruments for furnaces, ovens, dryers and kilns are described in this bulletin. It features electronic potentiometer and millivoltmeter type pyrometer controllers, recorders and indicators. A variety of electric, air-operated, and electronic control instruments for use with fuel-fired and electric heating equipment of all types is listed. Complete engineering specifications are given, along with photographs and diagrams of the various control arrangements and dimension sketches.

Bulletin P1255. Pp. 12. The Bristol Co., Waterbury 20, Conn.

ROCKWELL 201 ORIFICE METERS. This generously illustrated color bulletin features 3½ pages of tables giving representative orifice capacities to aid the measurement man in sizing orifice meter plates. With the aid of front and rear view sectional photographs, the bulletin shows how the meters are constructed and how they operate. There are descriptions of manifold arrangements and differential ranges available; pictures and drawing of various elements of the meters to show specific design features; drawings showing how the meters are used with liquid seal chambers and piping for steam, corrosive gases and liquids. Complete specifications are offered for meter mountings and manifold, straightening vanes, forged steel orifice flange unions and ring-type joints. Other features described include: general instructions for meter servicing, meter testing and operating practice, square root charts, instructions for testing differential, the new differential controller, and descriptions of allied products.

Bulletin 1050 Rev. 1. Pp. 28. Rockwell Mfg. Co., 400 No. Lexington Ave., Pittsburgh 8, Pa.

SELAS SERIES PRS SPEAR FLAME GAS BURNERS. This bulletin describes the spear flame burner in the five sizes manufactured by the company. There are full size illustrations of the burners and the flame length produced by them, together with Btu capacity, port area and full dimensions. A list of various recommended industrial uses covers a wide range of applications. The burners are normally used for open firing either individually or in groups where a focused or spot heat is required, and use any commercial fuel gas and any air-gas mixing system which will develop the required pressure to produce the desired flame focusing or heat direction.

Bulletin SC-1001. Pp. 4. Selas Corporation of America, Philadelphia 34, Pa.

INDUSTRIAL CONTROLS. This fully illustrated bulletin offers complete descriptions and information about the company's non-indicating electric, electronic and pneumatic controllers for temperature, pressure and humidity, and pneumatic and electric valves, switches and relays. Specifications, dimension drawings, application data and ordering information are included. The bulletin contains photographs of instruments and a variety of tables. Also presented are sections on: magnetic starters and contactors; pneumatic motors; and pneumatic control accessories.

Bulletin Catalog 8305. Pp. 80. Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Windrim Aves., Philadelphia 44, Pa.

PHOTOELECTRIC RECORDER APPLICATIONS. This two-color, fully illustrated bulletin describes applications of the photoelectric recorder with seismology, psychology, textile, metals, fatigue and research testing equipment, as an aid in detection of pipeline corrosion, and in development and machinability testing, light-intensity study, and paper-machine-speed measuring. A listing of the recorder's typical rating is included.

Bulletin GEA-5536. Pp. 12. General Electric Co., Schenectady 5, N. Y.

INDUSTRIAL GAS RESEARCH BULLETINS. To fulfill many requests, Industrial Gas Research Bulletin Nos. 11 and 15 have been reprinted and are now available from American Gas Association's headquarters and AGA Laboratories. Bulletin No. 11, "Composition of Furnace Atmospheres Resulting from Partial Combustion of Gaseous Fuels," reports a study of combustion characteristics with insufficient air supplied for complete combustion of gas in furnaces of simple design.

Bulletin No. 15, "Combustion of Gas with Limited Air Supply," outlines results obtained with and without application of heat external to combustion chambers and the effects of catalysts to promote combustion at aerations lower than otherwise obtainable.

Bulletin Nos. 11 and 15. American Gas Association Laboratories, 1032 E. 62 St., Cleveland 3. $1.25 and $1.75, respectively.

MILLIVOLTMETER TYPE INSTRUMENTS. This completely illustrated bulletin describes the company's millivoltmeter type instruments: indicators, indicating electronic controllers and excess temperature safety cut-off controllers. Information on operation and applications of on-off, two-position, three-position and pulse type time-proportioning controllers is included as well as data on primary measuring elements, dimensions ordering information and scale selection tables. The bulletin contains photographs of instruments and diagramatic charts.

Bulletin 1053. Pp. 20. Minneapolis Honeywell Regulator Co., Philadelphia 44.

SONNER TYPE LV GAS BURNER. This illustrated color bulletin describes the LV gas burner for large heating and power boilers. The burner assembly includes two or more burners manifolded together with a welded pipe header, draft box and sufficient plain pilots for smooth ignition. The burner consists of an orifice assembly and venturi tube to which are fitted 1 to 9 LV heads by means of ground tapered joints. Information is included on: burner; head; specifications for assembly; and capacities, dimensions and equipment of assemblies.

Bulletin 52-LV-1. Pp. 4. Sonner Burner Co., Winfield, Kans.

CUSTOM LEAK DETECTION SERVICE. A custom leak detection service, designed for tests of either vacuum or pressure prototypes, development models, pilot models, special laboratory equipment, etc., is described in this bulletin. Employed, in conjunction with a company leak detector, is a ten-port vacuum manifold capable of testing nine samples simultaneously, comparing leakage to a standard leak. This standard conforms with government leak specifications of 0.1—0.01 micron foot per hour. Inert, non-contaminating helium is used as a probe gas, and its passage through even the smallest leak in parts or equipment under test is said to be instantly detected by the company's leak detector, a simplified, portable mass spectrometer sensitive to minute traces of helium. Corrosive, toxic or explosive materials are used.

Bulletin 1813 Supp. Pp. 5. Consolidated Engineering Corp., 300 N. Sierra Madre Villa, Pasadena 8, Cal.

(Continued on page 40)

THE CLEVELAND BABY DIGGER MODEL 92. This two-color amply illustrated bulletin describes the company's improved model trencher. There is complete information on design and construction, a table of digging wheel and traction speeds furnished by the new 4-speed motor transmission. Complete dimensions and specifications are given, including a table of optional cutting widths. The bulletin describes component parts and special features of the trencher, and contains action photographs which illustrate numerous job applications.

Bulletin No. S53. Pp. 8. The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17.

SCHIELD BANTAM T-35 TRUCK CRANE. This illustrated bulletin contains complete information on the company's 6-ton, ⅜-yard truck crane, including detailed mechanical specifications, together with complete dimensions and operating data, and information on various truck mountings and typical interchangeable attachments used with the company's crane boom. Charts showing lifting capacities at various radii for both 2½ and 4-ton truck mountings, using 25' to 45' booms, are presented. Also, provided is complete data on weights, applications and approximate production output of 8 different attachments including: clamshell and dragline buckets; concrete bucket; wood grapple; electric magnet; scrap grapple; pile driver, and auto body compressor.

Bulletin TCR-201. Pp. 6. Schield Bantam Co., Waverly, Ia.

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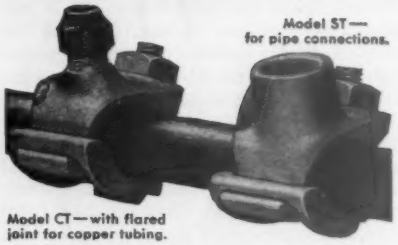

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ROCKWELL LUBRICANTS FOR NORDSTROM VALVES. This comprehensive bulletin describes lubricants, lubricant fittings and lubrication methods for the manufacturer's valves. Three major types of lubricant are described and their functions are listed in detail. A selection chart is offered showing which lubricants are recommended for use with a variety of fluids. The company's new bulk and gun tube lubricants, stick lubricants, bulk lubricant cans are described also. A feature of the bulletin is an outline of the three functions of a lubricant in Nordstrom valves—lubrication of the seat, provision of an impervious seal around each port under pressure, and provision of the hydraulic means for lifting the plug from its tapered seat.

Bulletin V-220. Pp. 12. Rockwell Mfg. Co., 400 No. Lexington Ave., Pittsburgh 8, Pa.

ELECTRONIK CIRCULAR CHART RECORDERS & STRIP CHART RECORDERS. Three new bulletins have been released which describe and illustrate the company's recording potentiometers. The bulletin on circular chart recorders presents specifications for all models on: calibrations, calibrated accuracy, chart, scale, voltage and frequency and accessories. Information is also given on individual models. The bulletins on the strip chart recorders present information on single record, pen type and multiple record, print wheel type. Diagrams, over-all dimensions and ordering information are included.

Bulletins 160, 164 & 165. Pp. 4. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne and Windrim Aves., Philadelphia 44, Pa.

J-W COMBUSTIBLE GAS ALARMS FOR MULTI-POINT INDUSTRIAL PROTECTION. Scanning type multi-point combustible gas alarms for industrial protection are described in this bulletin. It illustrates and describes indicating and recording instruments in standard and explosion-proof styles. Detail is provided on the means by which samples are continuously drawn to the analyzer unit from remote points and measured for combustibility on a 30-second cycle. In a tabulation of specifications, data is included on: number of sample points which can be handled, power requirements, alarm points available, type of signals utilized, sampling rate, and dimensions of instrument housing.

Bulletin No. RV 453. Pp. 2. Johnson-Williams, Ltd., Palo Alto, Cal.

METAMETER TELEMETERING INSTRUMENTS. This new bulletin contains information on the use of the company's metameter telemetering instruments for remote recording, indicating, and automatic control of variables over distances from a few feet to many miles. The company's new electronic dynamaster transmitters and receivers are described, and information is given on various methods of transmission. A number of typical installations are illustrated and described, including: remote readings of transmission and distribution pressures, regulator inlet and outlet pressures, holder pressure and height, and reading and integration of flow.

Bulletin M1710. The Bristol Co., Waterbury 20, Conn.

BURLING TEMPERATURE CONTROLS. This illustrated bulletin is said to be the first of a new series describing the manufacturer's line of temperature controls. It covers two of the models which are primarily used for high temperature safety alarms and cut-outs up to 1800°F. Included are complete descriptions of operation, dimensions, methods of mounting, and operating specifications. Both of the units described operate by differential expansion of solids, use snap-action switch rated at 15 amp, 125-250 volts, 60 cycles, and can be obtained with a wide variety of standard and special tubes.

Bulletin 101. Pp. 2. Burling Instrument Co., 5 Vose Ave., South Orange, N. J.

BAKER SHURSEAL SADDLES. The saddle described in this bulletin combines three sealing elements in a saddle gasket, which is said to result in a triple-sealing gasket. The bulletin presents the features of the saddle, and information on the company's cast iron saddles and bronze saddles. Included is data on straps, gaskets, and tap.

Bulletin 23-26. Pp. 2. R. H. Baker & Co., Inc., 2070 E. Slauson Ave., Huntington Park, Calif.

WALL-VENT INSTALLATION INSTRUCTIONS. This new bulletin calls attention to new AGA and UL requirements pertaining to venting of recessed wall heaters. Detailed instructions are given for installing the company's wall vent in both new and existing construction.

Bulletin 34. Pp. 6. Metalbestos Div., William Wallace Co., Belmont, Calif.

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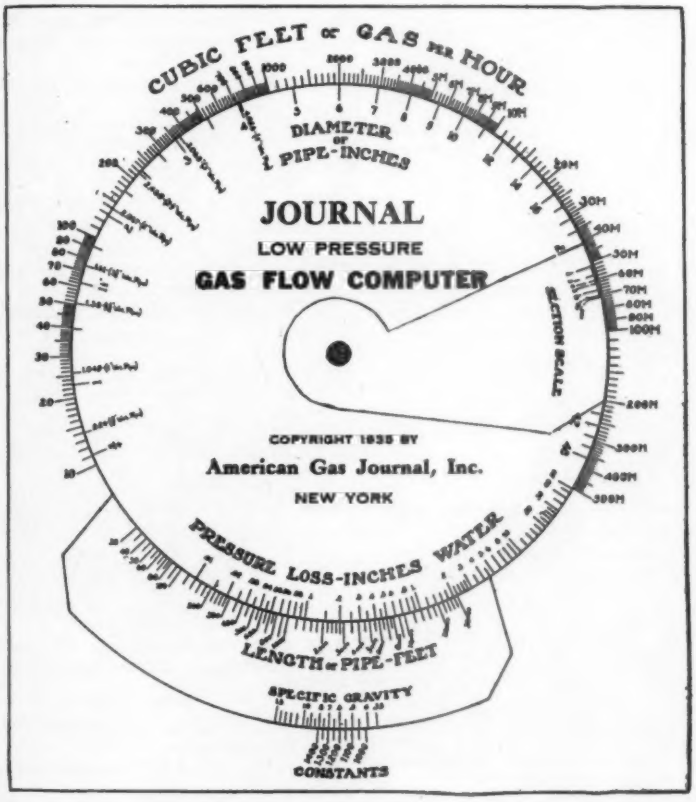

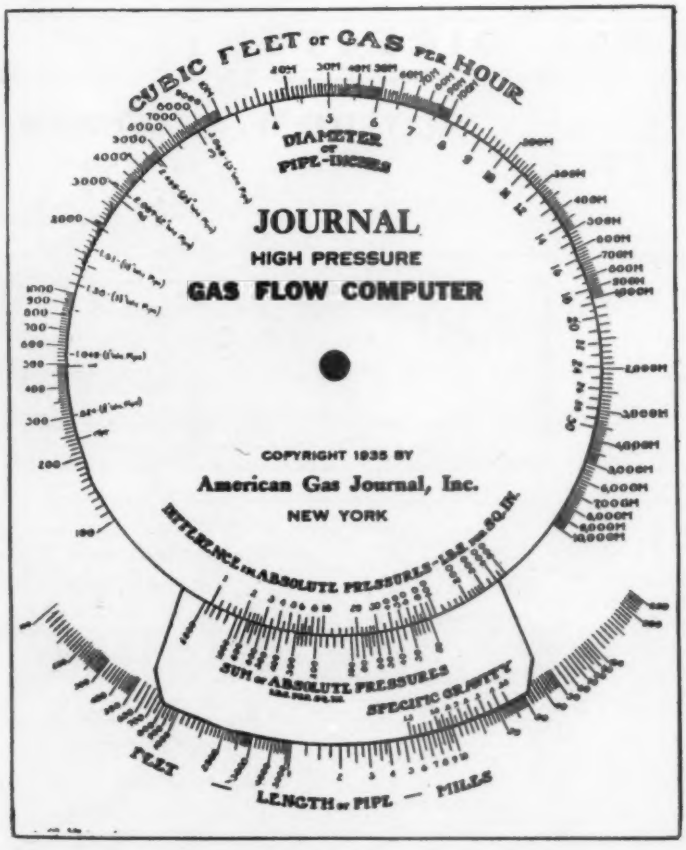

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GAS INDUSTRY CALENDAR

September

9-11 PCGA, San Francisco.
9-11 30th Mid-West Gas School and Conference, Iowa State College, Ames, Iowa.
11 New Jersey Gas Association, Spring Lake, N. J.
15 PAR Committee, AGA headquarters, New York.
26 Southern Gas Association, transmission section, round table on rights-of-way problems, Tutwiler Hotel, Birmingham.

October

6-7 Texas Mid-Continent Oil & Gas Association, Rice Hotel, Houston.
7-9 National Association of Corrosion Engineers, South Central region, Mayo Hotel, Tulsa.
19-21 American Standards Association, Waldorf Astoria Hotel, New York.
19-23 National Safety Council, Chicago.
19-23 National metal exposition, Public Auditorium, Cleveland.
26 AGA Board of Directors, St. Louis.
26-28 AGA annual convention, Kiel Auditorium, St. Louis.

November

9-13 National Hotel Exposition, Kingsbridge Armory, New York.
11-13 Wisconsin Utilities Association, Hotel Schroeder, Milwaukee, Wis.
17-20 AGA operating section, organization meetings, Hotel New Yorker, New York.
18-20 Mid-Southeastern Gas Association, Sir Walter Hotel, Raleigh, N. C.
29-December 4 The American Society of Mechanical Engineers, Statler Hotel, New York.
30-December 2 Southern Gas Association, advisory council and management conference, Grand Hotel, Point Clear, Ala.

March, 1954

4-5 AGA transmission and storage conference, Jung Hotel, New Orleans.
15-17 Mid-West Gas Association, Fort Des Moines Hotel, Des Moines, Iowa.
25-26 Oklahoma Utilities Association annual convention, Biltmore Hotel, Oklahoma City.
25-26 New England Gas Association, Hotel Statler, Boston.

April, 1954

5-7 Southern Gas Association (Location to be announced)
12-14 AGA Sales Conference on Industrial and Commercial Gas, Edgewater Beach Hotel, Chicago.
13-15 Southwestern gas measurement short course, University of Oklahoma, Norman, Okla.
20-23 AGA Distribution, Motor Vehicles and Corrosion Conference, Mount Royal Hotel, Montreal, Canada.
26-28 Mid-West Regional Sales Conference, Edgewater Beach Hotel, Chicago.
26-28 The 1954 annual convention, Southern Gas Association, Houston.

May, 1954

10 (week) 35th Annual National Restaurant Convention and Exposition, Navy Pier, Chicago.
10 (week) AGA commercial gas school, Chicago.
10-13 LPGA Annual Convention, Conrad Hilton Hotel, Chicago.
19-21 GAMA annual meeting, The Drake, Chicago.
24-26 AGA Production and Chemical Conference, Wm. Penn Hotel, Pittsburgh.
27-28 Natural Gas and Petroleum Association of Canada, Prince Edward Hotel, Windsor, Ontario, Canada.

June, 1954

20-24 Canadian Gas Association, Banff Springs Hotel, Banff, Alberta, Canada.
28-29 Michigan Gas Association, Grand Hotel, Mackinac Island, Mich.

July, 1954

19-23 Western summer radio-television and appliance market, Western Merchandise Mart, San Francisco.

September, 1954

8-10 Pacific Coast Gas Association, Victoria, British Columbia.
28-29 Texas Mid-Continent Oil and Gas Association, Baker Hotel, Dallas.

October, 1954

11-14 AGA annual convention, Atlantic City, N. J.
18-22 National Safety Council, Chicago.

November, 1954

1-5 National Metal Exposition, Chicago.

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